

Schools Chemical Management TOOLKIT



ADEQ
Arizona Department
of Environmental Quality



A collection of guidelines, resources and common sense rules
to properly and safely manage the chemicals used at schools.

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Arizona Department of Environmental Quality (ADEQ)
Office of Children's Environmental Health (OCEH)
Toolkit for Chemical Management in Schools

This document was produced as part of the final report of the project "Chemical Management at the Arizona Border Schools" and it is being made publicly available as a tool that schools can use to establish or to improve the way they currently use, storage and dispose of their chemicals.

This project was funded by the U.S. Environmental Protection Agency (EPA) and was carried out by ADEQ staff from the Office of Children's Environmental Health (OCEH) and the Office of Border Environmental Protection (OBEP) in collaboration with the Bureau of Applied Research in Anthropology (BARA) of the University of Arizona.

I. INTRODUCTION

The purpose of ADEQ's Chemical Management Toolkit is to introduce ADEQ's approach to the U.S. EPA's School Chemical Cleanout Campaign (SC3) to Arizona K-12 schools. The SC3 aims to ensure that all schools are free from hazards associated with mismanaged chemicals. Schools use a variety of chemicals for maintenance and cleaning, pest control, as well as in classrooms like science labs and art and trade (e.g. wood shop, auto, etc.) classes. When they are mismanaged, these chemicals can put students and school personnel at risk from spills, fires, and other accidental exposures and contamination in and around schools. Exposure to environmental hazards in schools can negatively impact the health of children, and school staff. Healthy school environments can improve attendance, concentration and performance, as well as reduce or eliminate expensive and time-consuming clean-up and/or remediation activities.

This Toolkit has been created to provide Arizona schools with the basic information and resources needed to remove unnecessary, outdated, or unknown chemicals; prevent chemical mismanagement or incidents in schools; and heighten awareness in the school community of the importance of proper chemical management.

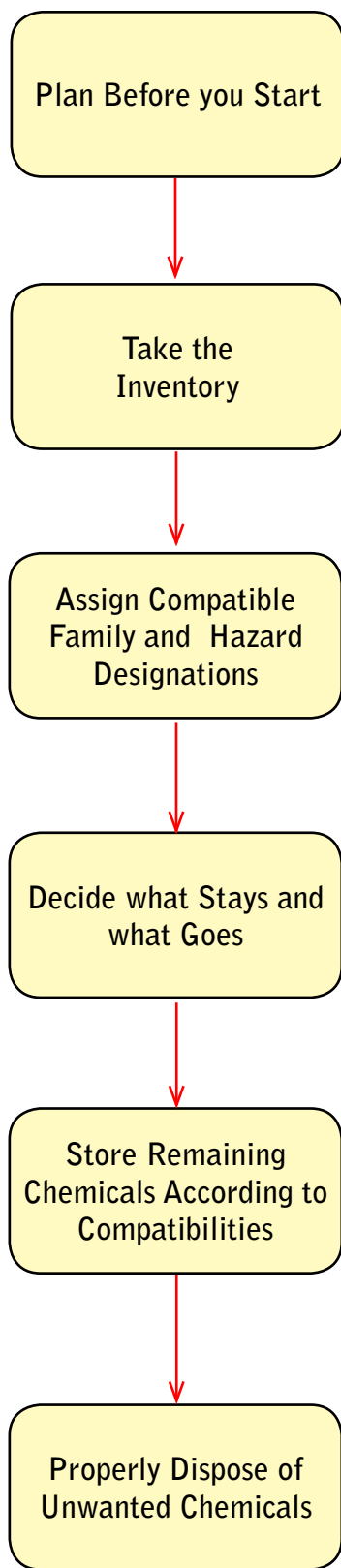
To avoid potentially hazardous chemical incidents at schools, an individual school or a school district can establish a School Chemical Management Program which identifies, manages, and prevents hazards through all stages of chemical purchasing, storage, use, and disposal. Such a program can also help to reduce the quantity and toxicity of chemicals used in a school's curriculum; used in cleaning and maintenance of the school grounds and landscape; and to prevent the buildup of a surplus chemical inventory.

Performing a chemical cleanout of a school necessitates a multifaceted approach led by the school's administration and backed by the district superintendent and other personnel. It should also include the assistance of the local fire department and other subject matter experts, as appropriate. One of the first steps is informing employees of the federal laws that regulate chemical use. Most notably is OSHA's Right to Know Law ("HAZCOM") or CFR 1910.1200. The crux of HAZCOM, Safety and Health Topics - Hazard Communication - is simply that employees have a right to know what chemicals they are working with or around in their

workplace. HAZCOM mandates that all chemicals in the workplace be evaluated for health and physical hazards and requires that information be made available to all employees.

This Toolkit includes the following:

- A step-by-step process for conducting a comprehensive inventory of all chemical substances present at a school *{See Chapter II, Page 5}*.
- Sample Inventory Worksheet for documenting all chemicals present on campus *{See Chapter III, Page 8}*.
- An outline for establishing a chemical management plan for purchasing, managing, storing and disposing of chemical substances present in schools *{See Chapter VI, Page 15}*.
- A discussion of what is a Material Safety Data Sheet (MSDS) and what information is provided in each Section of an MSDS *{See Chapter VII, Page 19}*.
- Guidance on requesting an EPA Identification Number *{See Chapter IX, Page 34}*. An EPA Identification number is required for any location that generates 220 pounds or more of hazardous waste in any calendar month.
- A glossary of terms related to chemical management *{See Chapter X, Page 38}*.
- Recommended Best Assessment Practices (BAPs) for Governing Body or Oversight Committee presiding over the Development of a Chemical Management Plan.



II. BASIC INSTRUCTIONS FOR CONDUCTING A CHEMICAL INVENTORY IN SCHOOLS

GOAL: To determine what chemical substances are present in your schools, their quantities and their condition *{See Chapter VI, Page 15}*.

PURPOSES:

- ◆ To remove from schools excess, unused, deteriorated or outdated chemicals
- ◆ To identify potentially dangerous chemicals that should not be present or used
- ◆ To ensure that all chemicals are managed appropriately
- ◆ To comply with all local, state and federal regulatory requirements.

1. PLAN BEFORE YOU START

- ◆ Never work alone
- ◆ Don't involve students
- ◆ Use appropriate personal protective equipment *{See Chapter VIII, Section I-A-4(a), Page 21}*
- ◆ Have spill materials available and insure that emergency equipment is operational *{See Chapter VIII, Section I-A, Page 21}*.
- ◆ Know whom to call for help if needed *{See Chapter VIII, Section I-C, Page 21}*. Have phone numbers of the fire department and state contacts handy.

2. TAKE THE INVENTORY *{See Chapter III, Page 8}*

CAUTION: AVOID TOUCHING OR MOVING CONTAINERS AS OLD CHEMICALS MAY BECOME UNSTABLE AND SOME CHEMICALS FORM EXPLOSIVE COMPOUNDS AS THEY AGE.

Interview appropriate staff members to ensure all chemicals in a particular area are identified and inventoried and to assess level of understanding with proper chemical management *{See Chapter XI, Page 41}*.

FOR EACH SUBSTANCE RECORD:

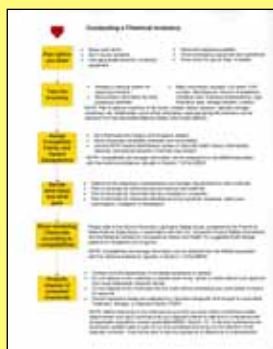
- ◆ The full name
- ◆ The Chemical Abstract Number (CAS)
- ◆ Manufacturer's name
- ◆ Size of the container
- ◆ Type of container i.e., metal, glass, gas cylinder
- ◆ Expiration date or approximate age of the substance
- ◆ Storage situation and location, i.e. shelf, refrigerator, cabinet (locked or not locked, fire approved or not), chemistry/biology/storage room location and shelf.

NOTE: Much of this information can be obtained from the MSDS associated with the chemical substance *{See Chapter VII, Page 19}*.

THE GOAL for conducting a chemical inventory is to determine what chemical substances are present in your schools, their quantities and their condition.



[Click here to see a School Chemical Clean-Out Overview flow chart to visualize the process, or see page 49.](#)



[Click here to see a flow chart showing the process to conduct a chemical inventory, or see page 50.](#)

3. ORGANIZE YOUR LIST. Once you have recorded the inventory information, assign compatible family designations and hazard data to each listing *[See Chapter IV, Page 9]*.

Enter family and hazard designation to Inventory Worksheet in designated columns.

NOTE: Compatibility and hazard information can be obtained from the MSDS associated with the chemical substance; typically in Section 7 of the MSDS

4. DECIDE WHAT STAYS AND WHAT GOES.

- ◆ Determine the hazardous characteristics and storage requirements for each chemical
- ◆ Plan to eliminate all chemicals that are beyond their shelf life
- ◆ Plan to eliminate all chemicals that are unusable or unneeded
- ◆ Plan to eliminate all chemicals identified as shock sensitive, explosive, highly toxic, carcinogenic, mutagenic or teratogenic

Identify which substances stay or go on the Inventory Worksheet in designated column.

NOTE: Before disposing of any chemical be sure that you have made a hazardous waste determination and have confirmed that your disposal method is safe and in compliance with all applicable regulations (review MSDS, Section 13). If unknown substances are discovered, please make a note of it on the worksheet and bring it to the attention of the disposal contractor. They will be able to test the substance to determine its characteristics.

- * CONTACT YOUR LOCAL FIRE DEPARTMENT IF IMMEDIATE ASSISTANCE IS NEEDED
- * DO NOT DISPOSE OF ANY MATERIALS OR WASTES DOWN SINKS TOILETS OR DRAINS WITHOUT PRIOR APPROVAL FROM THE LOCAL WASTE WATER TREATMENT DEPARTMENT.
- * DO NOT DISPOSE OF ANY CHEMICALS INTO THE TRASH WITHOUT CONTACTING YOUR SOLID WASTE DISPOSAL COMPANY FOR APPROVAL.

5. REORGANIZE WHAT IS LEFT. Reorganize the remaining substances for future storage into chemical families ensuring vertical and horizontal compatibility and compliance with local fire code *[See Chapter V, Page 12]*.

Please refer to the [School Chemistry Laboratory Safety Guide](#), published by the Council of State Science Supervisors, in association with the U.S. Consumer Product Safety Commission and the National Institute for Occupational Safety and Health, for suggested shelf storage patterns for



CAUTION:

Avoid touching or moving containers as old chemicals may become unstable, and some chemicals form explosive compounds as they age.

Inorganics and Organics.

NOTE: Compatibility and storage information can be obtained from the MSDS associated with the chemical substance; typically in Section 7 of the MSDS.

6. ESTABLISH A PLAN. Establish and implement a chemical management plan for purchasing, managing, storing and disposing of chemicals in the future *[See Chapter VI, Page 15]*.

IV. CHEMICAL FAMILIES AND HAZARD GUIDE

FLINN CHEMICAL CATALOG/REFERENCE MANUAL'S SUGGESTED ARRANGEMENT OF COMPATIBLE CHEMICAL FAMILIES	
First sort chemicals into organic and inorganic classes. Next, separate into the following compatible families.	
INORGANICS	ORGANICS
1. Metals, hydrides	1. Acids, anhydrides, peracids
2. Halides, halogens, phosphates, sulfates, sulfites, thiosulfates	2. Alcohols, amides, amines, glycols, imides, imines
3. Amides, azides*, nitrates* (except ammonium nitrate**), nitrites*, nitric acid	3. Aldehydes, esters, hydrocarbons
4. Carbon, carbonates, hydroxides, oxides, silicates	4. Ethers*, ethylene oxide, halogenated hydrocarbons, ketenes, ketones
5. Carbides, nitrides, phosphides, selenides, sulfides	5. Epoxy compounds, isocyanates
6. Chlorates, chlorites, hydrogen peroxide*, hypochlorites, perchlorates*, perchloric acid*, peroxides	6. Azides*, hydroperoxides, peroxides
7. Arsenates, cyanates, cyanides	7. Nitriles, polysulfides, sulfides, sulfoxides
8. Borates, chromates, manganates, permanganates	8. Cresols, phenols
9. Acids (except nitric acid)	
10. Arsenic, phosphorous*, phosphorous pentoxide*, sulfur	
*Chemicals deserving special attention because of their potential instability ** Store Ammonium Nitrate away from all other substances	

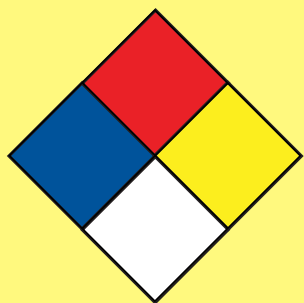
Please refer to the [School Chemistry Laboratory Safety Guide](#), published by the Council of State Science Supervisors, in association with the U.S. Consumer Product Safety Commission and the National Institute for Occupational Safety and Health, for suggested shelf storage patterns for Inorganics and Organics.

THE ANSI/NFPA 704 HAZARD IDENTIFICATION SYSTEM


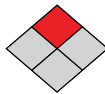
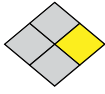
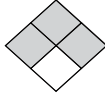
NOTE: The NFPA diamond is a quick visual review of the health hazard, flammability, reactivity, and special hazards a chemical may present.















The diamond is broken into four sections (blue, red, yellow, and white). The symbols and numbers in the four sections indicate the degree of hazard associated with a particular chemical or material as follows:

The NFPA diamond is a quick visual review of the health hazard, flammability, reactivity, and special hazards a chemical may present.



The diamond is broken into four sections (blue, red, yellow, and white). The symbols and numbers in the four sections indicate the degree of hazard associated with a particular chemical or material.

HEALTH HAZARD (BLUE)			
4	Danger	May be fatal on short exposure. Specialized protective equipment required	
3	Warning	Corrosive or toxic. Avoid skin contact or inhalation	
2	Warning	May be harmful if inhaled or absorbed	
1	Caution	May be irritating	
0		No unusual hazard	
FLAMMABILITY (RED)			
4	Danger	Flammable gas or extremely flammable liquid	
3	Warning	Combustible liquid flash point below 100 °F	
2	Caution	Combustible liquid flash point of 100° to 200 °F	
1		Combustible if heated	
0		Not combustible	
REACTIVITY (YELLOW)			
4	Danger	Explosive material at room temperature	
3	Danger	May be explosive if shocked, heated under confinement or mixed with water	
2	Warning	Unstable or may react violently if mixed with water	
1	Caution	May react if heated or mixed with water but not violently	
0	Stable	Not reactive when mixed with water	
SPECIAL NOTICE KEY (WHITE)			
W	Water Reactive		
OX	Oxidizing Agent		

COMMON SAFETY SYMBOLS		
DOMESTIC SYMBOL	INTERNATIONAL SYMBOL	MEANING
		Flammable
		Explosive
		Corrosive
		Poison
		Radioactive
		Compressed Gas
		Oxidizer
		Low Level Hazard
		Severe Chronic Hazard
		Environmental Hazard

Use the Chemical Compatibility Guide to properly segregate all the chemicals present in the schools. Follow the guide to keep separated those materials marked as “incompatible”



Keep the storage places secured, well ventilated and free of water leaks or humidity sources; keep in mind that some chemicals are incompatible even with water.



Students must not have access to the place where chemicals are stored.

V. BASIC CHEMICAL COMPATIBILITY GUIDE

CHEMICAL	IS INCOMPATIBLE AND SHOULD NOT BE MIXED OR STORED WITH
Acetic acid	Chromic acid, nitric acid, hydroxyl compounds, ethylene glycol, perchloric acid, peroxides, permanganates
Acetylene	Chlorine, bromine, copper, fluorine, silver, mercury
Acetone	Concentrated nitric and sulfuric acid mixtures
Alkali and alkaline earth metals (such as powdered aluminum or magnesium, calcium, lithium, sodium, potassium)	Water, carbon tetrachloride or other chlorinated hydrocarbons, carbon dioxide, halogens
Ammonia (anhydrous)	Mercury, chlorine, calcium hypochlorite, iodine, bromine, hydrofluoric acid (anhydrous)
Ammonium nitrate	Acids, powdered metals, flammable liquids, chlorates, nitrates, sulfur, finely divided organic or combustible materials
Aniline	Nitric acid, hydrogen peroxide
Arsenical materials	Any reducing agent
Azides	Acids
Bromine	See Chlorine
Calcium oxide	Water
Carbon (activated)	Calcium hypochlorite, all oxidizing agents
Carbon tetrachloride	Sodium
Chlorates	Ammonium salts, acids, powdered metals, sulfur, finely divided organic or combustible materials
Chromic acid and chromium trioxide	Acetic acid, naphthalene, camphor, glycerol, alcohol, flammable liquids in general
Chlorine	Ammonia, acetylene, butadiene, butane, methane, propane (or other petroleum gases), hydrogen, sodium carbide, benzene, finely divided metals, turpentine
Chlorine dioxide	Ammonia, methane, phosphine, hydrogen sulfide
Copper	Acetylene, hydrogen peroxide
Cumene hydroperoxide	Acids (organic or inorganic)
Cyanides	Acids
Flammable liquids	Ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens

Schools shall discard all the expired chemicals. These materials may not be good anymore for their original purpose but they are still a potential hazard for human health and for the environment.



Check the storage place several times a year. Look for signs of corrosion, leakings, spills, etc. Report any visual anomaly.

CHEMICAL	IS INCOMPATIBLE AND SHOULD NOT BE MIXED OR STORED WITH
Fluorine	Everything
Hydrocarbons (such as butane, propane, benzene)	Fluorine, chlorine, bromine, chromic acid, sodium peroxide
Hydrocyanic acid	Nitric acid, alkali
Hydrofluoric acid (anhydrous)	Ammonia (aqueous or anhydrous)
Hydrogen peroxide	Copper, chromium, iron, most metals or their salts, alcohols, acetone, organic materials, aniline, nitromethane, combustible materials
Hydrogen sulfide	Fuming nitric acid, oxidizing gases
Hypochlorites	Acids, activated carbon
Iodine	Acetylene, ammonia (aqueous or anhydrous), hydrogen
Mercury	Acetylene, fulminic acid, ammonia
Nitrates	Sulfuric acid
Nitric acid (concentrated)	Acetic acid, aniline, chromic acid, hydrocyanic acid, hydrogen sulfide, flammable liquids, flammable gases, copper, brass, any heavy metals
Nitrites	Acids
Nitroparaffins	Inorganic bases, amines
Oxalic acid	Silver, mercury
Oxygen	Oils, grease, hydrogen, flammable liquids, solids, or gases
Perchloric acid	Acetic anhydride, bismuth and its alloys, alcohol, paper, wood, grease, oils
Peroxide, organic	Acids (organic or mineral), avoid friction, store cold
Phosphorus (white)	Air, oxygen, alkalis, reducing agents
Potassium	Carbon tetrachloride, carbon dioxide, water
Potassium chlorate	Sulfuric and other acids
Potassium perchlorate (see also chlorates)	Sulfuric and other acids
Potassium permanganate	Glycerol, ethylene glycol, benzaldehyde, sulfuric acid
Selenides	Reducing agents
Silver	Acetylene, oxalic acid, tartaric acid, ammonium compounds, fulminic acid
Sodium	Carbon tetrachloride, carbon dioxide, water
Sodium nitrate	Ammonium nitrate and other ammonium salts



Schools must always use a fume hood for all carcinogens, mutagens, teratogens, allergens, and toxic, corrosive, flammable and noxious chemicals.

CHEMICAL	IS INCOMPATIBLE AND SHOULD NOT BE MIXED OR STORED WITH
Sodium peroxide	Ethyl or methyl alcohol, glacial acetic acid, acetic anhydride, benzaldehyde, carbon disulfide, glycerin, ethylene glycol, ethyl acetate, methyl acetate, furfural
Sulfides	Acids
Sulfuric acid	Potassium chlorate, potassium perchlorate, potassium permanganate (similar compounds of light metals, such as sodium, lithium)
Tellurides	Reducing agents

VI. BASIC OUTLINE FOR A CHEMICAL MANAGEMENT PLAN

1. General Rules and Procedures - Establish Policy Statements for:

- a) Making it a priority to reduce the usage of hazardous chemicals in the classroom and to increase the usage of green alternatives.
- b) Personal hygiene guidelines *{See Chapter VIII, Section VIII-A, Page 29}*
- Procedures to avoid unnecessary exposure to chemicals by any route (i.e. ingestion, absorption, and inhalation) by addressing:
- c) General Safety Guidelines *{See Chapter VIII, Section VIII-B, Page 29}* - Procedures to reduce the risk of incidents.
- d) Assignment of responsibilities *{See Chapter VIII, Section VIII-C, Page 29}*
- Identify, at all relevant levels, someone responsible for ensuring conformance with the Chemical Management Plan.



[Click Here to see a flow chart so you can visualize how to create a School Chemical Management Plan, or see page 51.](#)

2. Inventory Control

- a) Chemical Procurement
 - (1) Issue statement that no prohibited chemicals will be purchased or otherwise brought onto the school campus.
 - (2) Specify personnel responsible for ordering chemicals and accepting shipments.
 - (3) Establish procedures for determining when a chemical needs to be purchased *{See Chapter VIII, Section VI, Page 27}*.
 - (4) Establish a process for submitting requests to purchase chemicals *{See Appendix A, Page 44}*.
- b) Chemical Management
 - (1) Chemical Inventory - Establish:
 - (a) Procedures for labeling chemicals with the purchase date
 - (b) A current inventory of all chemicals, including amounts and locations *{See Chapter III, Page 8}*.
 - (c) A plan for keeping the chemical inventory updated following purchases and distribution and disposal activities.
 - (d) A schedule for an annual audit of the chemical management plan - including inspecting storage areas and assessing chemicals and containers for signs of deterioration.
 - (e) Procedures for labeling compounded chemicals *{See Chapter VIII, Section VI-C, Page 27}*.
 - (2) Chemical Transportation - Establish:
 - (a) A list of personnel authorized and trained to transport chemicals on school premises.
 - (b) Procedures for obtaining and maintaining equipment suitable for transporting approved chemicals on school premises *{See Chapter VIII, Section VII-D, Page 28}*.
 - (c) Procedures for procuring, evaluating integrity, and using appropriate PPE related to transporting chemicals on school premises.
 - (d) A simple chain of custody process to document transfer of chemicals from one location to another.



Schools shall make sure that the available protective equipment is working properly.

Training programs should include basic medical information such as signs and symptoms of overexposure to chemicals and understanding of the permissible exposure limits (PELs) used in the school.

- (e) Standard operating procedures for transporting chemicals on school premises.
- c) Chemical Storage
 - (1) General storage area - Establish:
 - (a) A list of personnel who are authorized to be in the chemical storage area(s).
 - (b) Guidelines for storing chemicals by compatibility families *{See Chapter IV, Page 9}*.
 - (c) Procedures for labeling storage shelves and dedicated cabinets.
 - (d) Procedures to ensure chemicals are not stored next to incompatible chemicals *{See Chapter V, Page 12}*.
 - (e) Compressed Gas storage and handling procedures, if applicable *{See Chapter VIII, Section VII-A, Page 28}*.
 - (f) Flammable chemicals handling procedures, if applicable.
 - (g) Corrosive materials handling and storage instructions, if applicable *{See Chapter VIII, Section VII-B, Page 28}*.
 - (h) Procedures for maintaining storage area(s) organized and uncluttered *{See Chapter VIII, Section VII-C, Page 28}*.
 - (2) Satellite Storage Area (e.g. Classroom) - Establish policies for:
 - (a) Maintaining an organized and uncluttered work area *{See Chapter VIII, Section VII-C, Page 28}*
 - (b) Keeping containers closed when not in use so that contents cannot evaporate or escape from a tipped container.
 - (c) Returning chemicals to their proper place after use, or before leaving the workstation at the end of the day.
 - (d) Labeling prepared solutions and mixtures with the name of the compound, primary hazards, date of preparation, and initials of preparer.

NOTE: Chemical symbols alone are insufficient identification.

 - (e) Checking expiration dates on chemicals regularly. Dispose of them properly or use them promptly.
- d) Chemical Disposal
 - (1) Waste Designation - Establish policies for:
 - (a) Determining the hazardous characteristics and storage requirements for each chemical to be disposed of.
 - (b) Eliminating all chemicals that are beyond their shelf life.
 - (c) Eliminating all chemicals that are unusable or unneeded.
 - (d) Eliminating all chemicals identified as shock sensitive, explosive, highly toxic, carcinogenic, mutagenic or teratogenic
 - (e) Informing staff of state and Federal Hazardous Waste Generator status requirements *{See Chapter VIII, Section II, Page 25}*.
 - (2) On-site storage - Establish policies for:
 - (a) Ensuring that no regulated hazardous waste is stored on-site longer than 180 days.
 - (b) Developing and maintaining minimum standards for regulated hazardous waste container *{See Chapter VIII, Section III-A, Page 25}*.
 - (c) Labeling requirements for containers *{See Chapter VIII, Section III-B, Page 25}*.



The evacuation plan shall be an important part of the chemical management plan. It is highly recommended that the evacuation routes be communicated in advance and clearly marked.

(3) Waste Management - Establish:

NOTE: All the federal hazardous waste regulations are located in Title 40 of the Code of Federal Regulations (CFR), Parts 260 to 299 which are incorporated by Arizona Administrative Codes (AAC) R18-8-260 to 280. State regulations are located in Arizona Revised Statutes 49-901 through 49-944.

(a) Procedures for securing a contractor permitted to collect and legally dispose of generated hazardous waste *{See Chapter VIII, Section V, Page 26}*.

(b) Policies and procedures for minimizing waste *{See Chapter VIII, Section IV, Page 25}*.

(4) Managing Incidents - Establish:

(a) A list of response equipment that must be maintained and readily available to respond to incidents *{See Chapter VIII, Section I-D, Page 23}*.

(b) Procedures for investigating incidents after the fact *{See Chapter VIII, Section I-F, Page 24}*.

3. Spill and Incident Procedures

a) A written policy for responding to incidents and spills, including first aid procedures for eye contact, ingestion, skin contact and cleanup and disposal *{See Chapter VIII, Section I-C, Page 21}*.

b) A procedure for alerting all people in the building and immediate area of the incident or spill *{See Chapter VIII, Section I-E, Page 24}*.

4. Protective Apparel and Equipment

a) Evaluate all approved hazardous materials to assess protective equipment needs *{See Chapter VIII, Section IX, Page 30}*.

b) Establish schedule and procedure for testing safety equipment and apparel, e.g. eyewash stations, safety showers, fire extinguishers, hard hats, safety aprons, eye and ear protection, etc.

5. Awareness and Training Program to include:

a) Content and location of the Chemical Management Plan.

b) Potential hazards involved in using chemicals *{See Chapter VIII, Section X, Page 31}*.

c) Signs and symptoms of overexposure to chemicals.

d) Location and availability of the chemical MSDS.

e) Understanding of the permissible exposure limits (PELs) related to the chemicals used in the school.

f) Proper use and location of all safety equipment.

6. Area/Procedure-specific Safety Rules and Guidelines

a) Identification of chemicals or reactions that require use of a fume hood.

b) Requirement to use a fume hood for all allergens, and toxic, corrosive, flammable and noxious chemicals, if applicable.

- c) Specify limits for flammable solids and the safety precautions for their use.
- d) Specify the storage method for water-reactive solids.
- e) Procedures for handling dust like materials, especially those which may form explosive mixtures with air.
- f) Disposal requirements for chemical waste, outdated chemicals, and/or chemicals that have degraded.

7. Exposure Evaluation Procedures

- a) Procedures for handling suspected overexposures to chemicals
{See Chapter VIII, Section XI, Page 31}.
- b) Response procedures to suspected overexposures to chemicals
{See Chapter VIII, Section XI-C, Page 32}.

8. Medical Evaluation Policy

- a) Information to be provided to a physician or emergency responder if an overexposure has occurred or was suspected to have occurred
{See Chapter VIII, Section XI-D, Page 32}.

9. Emergency Evacuation Plan

- a) Planned, written, posted and communicated in advance?

VII. WHAT IS A MATERIAL SAFETY DATA SHEET?

Material Safety Data Sheets (MSDS) contain information regarding the proper procedures for handling, storing, and disposing of chemical substances.

- An MSDS accompanies all chemicals or kits that contain chemicals.
- If an MSDS does not accompany a chemical, many web sites and science supply companies can supply one.
- Save all MSDSs and store in a designated file or binder using a system that is organized and easy to understand.
- Place the MSDS collection in a central, easily accessible location known to all workers and emergency personnel or make them available electronically (e.g. on a school's intranet).

STANDARDIZED MSDS FORMAT

Section 1 gives details on what the chemical or substance is, CAS number, synonyms, the name of the company issuing the data sheet, and often an emergency contact number.

Section 2 identifies the OSHA hazardous ingredients, and may include other key ingredients and exposure limits.

Section 3 lists the major health effects associated with the chemical. Sometimes both the acute and chronic hazards are given.

Section 4 provides first aid measures that should be initiated in case of exposure.

Section 5 presents the fire-fighting measures to be taken.

Section 6 details the procedures to be taken in case of an accidental release. The instructions given may not be sufficiently comprehensive in all cases, and local rules and procedures should be utilized to supplement the information given in the MSDS sheet.

Section 7 addresses the storage and handling information for the chemical. This is an important section as it contains information on the flammability, explosive risk, propensity to form peroxides, and chemical incompatibility for the substance. It also addresses any special storage requirements for the chemical (i.e., special cabinets or refrigerators).

Section 8 outlines the regulatory limits for exposure, usually the maximum permissible exposure limits (PEL). The PEL, tells the concentration of air contamination a person can be exposed to for 8 hours a day, 40 hours per week over a working lifetime (30 years) without suffering adverse health effects. It also provides information on personal protective equipment.

Section 9 gives the physical and chemical properties of the chemical. Information such as the evaporation rate, specific gravity, and flash points are given.

Section 10 gives the stability and reactivity of the chemical with information about chemical incompatibilities and conditions to avoid.

Section 11 provides both the acute and chronic toxicity of the chemical and any health effects that may be attributed to the chemical.

Section 12 identifies both the ecotoxicity and the environmental fate of the chemical.

Section 13 offers suggestions for the disposal of the chemical. Local, state, and Federal regulations should be followed.

Section 14 gives the transportation information required by the Department of Transportation. This often identifies the dangers associated with the chemical, such as flammability, toxicity, radioactivity, and reactivity.

Section 15 outlines the regulatory information for the chemical. The hazard codes for the chemical are given along with principle hazards associated with the chemical. A variety of country and/or state specific details may be given.

Section 16 provides additional information such as the label warnings, preparation and revision dates, name of the person or firm that prepared the MSDS, disclaimers, and references used to prepare the MSDS.

Any person that discovers a situation such as a fire, explosion, unplanned release of hazardous waste or its constituents into the air, soil, surface water or sanitary sewers of affected buildings should immediately contact our Chemical Management Officer (CMO) at (XXX)-XXX-XXXX.

VIII. BEST MANAGEMENT OPTIONS

I. Information that may be applicable to a Chemical Management Plan.

A. Basic Spill Response Plan

1. Identify Substance.
2. Determine if safety equipment is needed to handle substance
3. Stop the source of spill or leak – Plug, turn off tap etc.
4. Contain the spill (in particular protect stormwater drains) – Basic spill equipment include:
 - (a) Personal Protective Equipment– Chemical appropriate gloves, goggles, sturdy shoes, lab coat/apron.
 - (b) Acids – Cat litter, sodium carbonate, pH paper test.
 - (c) Bases – Cat litter, then citric acid, pH paper test.
 - (d) Solvents – Cat litter/ oil/solvent absorbent pads.
 - (e) Sand, broom, dustpan, container with lid.
5. Report the spill – Make sure a procedure is in place to do this
6. Clean up spill – Collect all residues in a container
7. Dispose of spill waste and any contaminated clean up materials in a responsible manner – Through a responsible waste disposal contractor.
8. Replace lost material.
9. Review the incident – Update procedures as necessary.

B. Contingency Plan

1. Identify an emergency coordinator (employee) either at the facility or on call who is responsible for coordinating all emergency response measures. For Large Quantity Generators (LQGs), the contingency requirements are more stringent; if the school is an LQG, please refer to 40 CFR 265 for specific requirements.
2. Make readily available to all employees:
 - (a) The name and number of the emergency coordinator
 - (b) The locations of the fire extinguishers and spill control material
 - (c) The telephone number of the fire department
3. Ensure that all employees are thoroughly familiar with proper handling and emergency procedures.

C. Responding to Incidents

NOTE: Immediate action should be taken to control and contain any emergency (e.g. fire, explosion, medical, or spills) situation or incident.

1. Reporting incidents. Any person that discovers a situation such as a fire, explosion, unplanned release of hazardous waste or its constituents into the air, soil, surface water or sanitary sewers of affected buildings should immediately contact our Chemical Management Officer (CMO) XXX, at (XXX)-XXX-XXXX. If the incident poses an imminent threat, the person should activate the fire alarm prior to contacting the CMO.



If hazardous substances are stored onsite, all precautions must be taken to minimize the potential risks for fires, explosions or other accidents.

NOTE: It will be the responsibility of the CMO (or designee) once contacted to make the determination whether the incident in question requires: involving emergency services (i.e. police or fire department); contacting a regulatory agency to report the emergency; or evacuating the building.

2. If emergency services are required:

- (a) Fire or Police Department
 - (i) **Emergency - 911**
 - (ii) Fire (non-emergency) - *(Provide address) - Provide Phone Number*
 - (iii) Police (non-emergency) - *(Provide address) - Provide Phone Number.*
- (b) Regulatory Agencies.
 - (i) **National Response Center - 1-800-424-8802**
 - (ii) ADEQ Emergency Response Unit - 602-771-4106
 - (iii) Arizona Emergency Response Commission - 602-469-3401
 - (iv) EPA Region IX, Response Center - 415-744-2100
 - (v) Local Emergency Planning Committee - *(Provide Phone Number)*
- (c) Medical Services
 - (i) **Ambulance - 911**
 - (ii) Hospital - *Provide name, address and phone number*

3. If evacuating the building is necessary:

- (a) Activate fire alarm
- (b) Provide general evacuation procedures

4. Cleaning up small spills of neutral liquids

- (a) Ensure selected PPE is appropriate for liquid involved
- (b) Block nearby drains, preventing entry of the chemical
- (c) Turn off all sources of ignition
- (d) If the chemical container is still leaking, place it inside a tub, set it upright, or rotate it so that the puncture from which it is leaking is uppermost
- (e) To contain a spill, make a dam around the spill with absorbent and then cover the spill with the absorbent. Work from the outside edges of the spill to the center, taking care not to step in the spill
- (f) If stepping in a spill is unavoidable, be sure you are wearing protective footwear, that you do not spread the spill to uncontaminated areas and that you properly decontaminate or dispose of your footwear
- (g) Managing absorbent/chemical mixture.
 - (1) Pick up the absorbent/chemical mixture using the dustpan and brush. Place this mixture inside a plastic bag.
 - (2) If broken glass is involved, pick up the pieces with tongs and place the glass inside the plastic bag.
 - (3) Wipe the tools with paper towels and place the towels inside the bag.
 - (4) Wash the area of the spill with detergent and water; absorb the wash water with paper towels that can also go into the bag.



All emergency response equipment must be tested and maintained to ensure proper operation.



Ensure that personnel handling hazardous substance have immediate access to an alarm or emergency communications device.

- (5) Wash the tools, goggles, and gloves with detergent.
- (6) If the used PPE is disposable, dispose of it in the plastic bag containing the spill.
- (7) Dispose of plastic bag per the chemical disposal procedures established by this CMP.

5. Cleaning up small spills of liquid acids and bases

- (a) Follow Procedures for neutral liquids, noting that sodium bicarbonate may be used as both an absorbent and a neutralizing agent. Sodium bicarbonate is a buffer; it will neutralize both acids and bases: $\text{HCO}_3^- + \text{OH}^- \rightarrow \text{H}_2\text{O} + \text{CO}_3^{2-}$.
- (b) A great deal of heat is generated when sodium bicarbonate comes in contact with concentrated acids. Add it slowly and use extreme care to avoid contact with skin. For acids and bases comprised of nontoxic ions, the resulting mixture can be disposed of in the trash once it is neutral. If toxic ions are involved, such as in chromic acid, the mixture must be disposed of as hazardous waste.

6. Cleaning up spills of solids.

- (a) Ensure selected PPE is appropriate for solid involved
- (b) Carefully sweep up solids into the dustpan; avoid stirring up chemical dust; and place the chemical inside plastic bags.
- (c) Wash the spill area with detergent, wipe up with paper towels and place them in the plastic bag.
- (d) Wash tools and PPE with detergent. If they are disposable, place them inside the plastic bag with the other spill-related material
- (e) Dispose of plastic bag per the chemical disposal procedures established by this CMP.

7. Cleaning up mercury spills

D. Incident response equipment

- 1. Spill Absorbents - Materials capable of absorbing chemical spills.
- 2. Fire Extinguishers.
 - (a) Locations of exit stairwells, fire alarms, fire extinguishers and pull stations on each floor.
- 3. Face Shields with headgear and visor.
- 4. Chemical resistant gloves.
- 5. Bonding/grounding wire (for transferring chemicals)
- 6. Duct tape (for emergency repairs) NOTE: PPE should NOT be repaired; if a PPE becomes damaged, it must be removed and replaced with undamaged PPE.
- 7. Emergency Barricade Tape.
- 8. Plastic Bags with labels.
- 9. Brooms.
- 10. Shovels (Non-sparking)
- 11. Buckets/Barrels/Pails.
- 12. OSHA HAZCOM compliant labels.
- 13. Hazardous Waste compliant labels.

All work related incidents or illness shall be investigated and reported. At minimum the following questions need to be answered: Why, when and where to investigate?

14. Instructions for use of equipment and how to handle the cleaned up materials.
15. pH paper (0-12)
16. Drum spill kit
17. Drum transfer pump
18. Over packs - Compatible container large enough to enclose leaking container.

E. Issuing Incident Alerts

NOTE: If you store hazardous substances on-site, you must minimize the potential risks from fires, explosions or other accidents.

1. The School must be equipped with:
 - (a) An internal communications or alarm system capable of providing immediate emergency instruction to all personnel
 - (b) A device, such as a telephone or a hand-held, two-way radio, capable of summoning emergency assistance from local police and fire departments or emergency response teams
 - (c) Portable fire extinguishers, fire control devices, spill control materials, and decontamination supplies
 - (d) Water at adequate volume and pressure to supply water hose streams, foam-producing equipment, automatic sprinklers, or water spray systems
2. All emergency response equipment must be tested and maintained to ensure proper operation
3. Contact fire departments, police, and local hospitals for services in the event of an emergency
4. Allow sufficient aisle space to permit the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area where hazardous substances are used or stored
5. Ensure that personnel handling hazardous substance have immediate access to an alarm or emergency communications device

F. Investigating incidents after-the-fact

1. When conducting an incident investigation, you should remember several critical aspects to the investigation process:
 - (a) Why investigate?
 - (1) To discover or determine the root cause(s).
 - (2) To eliminate the cause and prevent reoccurrence
 - (b) When to investigate?
 - (1) Immediately following an incident
 - (2) Before there is an opportunity for persons to talk and influence others
 - (3) While physical conditions are unchanged
 - (4). Before possible excuses or second thoughts come into mind
 - (c) Where the investigation should take place?
 - (1) At the site of the incident
 - (2) All work related injuries or illnesses shall be investigated and the results reported to the employee's immediate supervisor or

Do not store more than 2,200 lb (1000 Kg) of hazardous waste on site.



Do not open, handle, or store containers in a way that may cause a leak. Look for leaks or any other type of deterioration.

Each container must be labeled as "hazardous waste".

manager. The supervisor may call on additional personnel and resources to complete the investigation as necessary.

(3) Cover every conceivable aspect of the incident or injured party's actions. An incident report form shall be used to document all incidents.

II. Requirements for Conditionally Exempt Small Quantity Generator (CESQG)

- A. Identify all hazardous waste generated and keep documentation of waste determination.
- B. Store no more than 2,200 lb (1,000 kg) of hazardous waste on-site at any time.
- C. Deliver hazardous waste to an off site treatment or disposal facility that is one of the following:
 - 1. An Arizona- or federally-regulated hazardous waste management treatment, storage, or disposal facility (TSDF).
 - 2. A facility permitted, licensed, or registered by Arizona to manage municipal or industrial solid waste.
 - 3. A facility that uses, reuses, or legitimately recycles the waste (or treats the waste prior to use, reuse, or recycling).
 - 4. A universal waste handler or destination facility subject to the universal waste requirements of 40 CFR Part 273 (as incorporated by R18-8-273) if the waste is universal waste.

III. Requirements for accumulation areas

A. Containers

- 1. The container must be closed during storage, except when adding or removing waste.
- 2. The container must be structurally sound
- 3. The container must be made of, or lined with, a material that is compatible with the hazardous waste to be stored
- 4. The container must lack evidence of leakage, spillage, or damage that could cause leakage. If a container leaks, put the hazardous waste in another container, or contain it in some other way that complies with EPA and state regulations.
- 5. Do not open, handle, or store (stack) containers in a way that might rupture them, cause them to leak, or otherwise fail.
- 6. Inspect areas where containers are stored at least weekly. Look for leaks and for deterioration caused by corrosion or other factors.

B. Packaging and Labeling

- 1. Each container or outer container must be labeled with the date hazardous waste was first added.
- 2. Each container must be marked, "Hazardous Waste."

C. Storage Time Limits

- 1. Generator - On-site for up to 180 days

Avoid mixing nonhazardous and hazardous waste. This practice makes recycling very difficult if not impossible.

The school is only allowed to send hazardous waste to a regulated treatment, storage, or disposal facility (TSDF) or recycler.

When shipping hazardous waste materials, the school must properly package, label and mark all shipments.

IV. Waste Minimization

NOTE: The Resource Conservation and Recovery Act (RCRA) gives EPA the authority to control hazardous wastes from the “cradle to grave.” Hazardous waste is a waste with properties that make it dangerous and potentially harmful to human health and the environment.

A. Avoid mixing nonhazardous waste with hazardous waste.

1. Nonhazardous waste mixed with hazardous waste, may increase the amount of hazardous waste created, as the whole batch may become hazardous.
2. Mixing waste can also make recycling very difficult, if not impossible.

B. Recycle or reuse materials, when possible.

C. Use fewer chemicals/solvents to do the same job, when possible; including inventory control/ordering chemicals in smaller containers.

D. Use solvents that are less toxic.

E. Replacing a material or a process with another that produces less waste.

F. Safely store hazardous products and containers

1. Avoid creating more hazardous waste by preventing spills or leaks.
2. Store hazardous products and waste containers in secure areas, and inspect them frequently for leaks. When leaks or spills occur, materials used to clean them up also become hazardous waste.

G. Questions regarding hazardous waste:

ADEQ Hazardous Waste Inspections and Compliance Unit

1110 West Washington St.

Phoenix, Arizona 85007

www.azdeq.gov

(602) 771-2300

V. Off Site Shipments

A. The school is prohibited from sending hazardous waste to a place other than a regulated Treatment, Storage, or Disposal Facility (TSDF) or recycler.

B. Prior to sending a shipment of hazardous waste to a TSDF or recycler, the school must ensure:

1. The TSDF or recycler agrees to receive the shipment.
2. The hazardous waste container is completely closed and sealed. Bungs must be tightened, and lids must be in place with bolt rings tightened.
3. The container is inspected to ensure that it can be safely transported without risk of spills or leaks. If a container is damaged, corroded, or otherwise structurally inadequate, the waste must be transferred to a new container or placed in an approved overpack drum prior to moving.
4. The transfer of a container between an area and a vehicle is accomplished using appropriate equipment in a way as to minimize the possibility of an accident or spill.

C. Labeling and Placards

1. The school must properly package, label and mark all hazardous waste shipments.
2. The school must ensure that vehicles in which hazardous wastes are shipped follow DOT placard regulations.
 - (a) DOT hazardous materials information line - (202) 366-4488
 - (b) ADOT, Hazardous Materials - (602) 712-4407.

VI. Procurement Considerations

A. Steps to determine if a chemical needs to be purchased

- (1) Check with other departments (and/or schools) to see if the chemical is already in stock and available.
- (2) Consider substituting a less toxic/hazardous form of the product if available. For example, high quality spirit or digital thermometers are as accurate as mercury thermometers without the associated toxic releases when broken.
- (3) Establish guidelines for when to purchase materials in bulk, in small concentrated amounts, and in pre-diluted amounts. When the cost of disposing excess chemicals is factored in, the economy size may not be the most economical choice.
- (4) Determine if there are any special handling or storage requirements for the chemical and, if so, if these requirements can be met. Consider also whether staff has the training and supplies to respond to a spill of the material.
- (5) Consider whether the chemical or product, when discarded, will be a regulated hazardous waste requiring special disposal or a non-hazardous waste that can be disposed of in the trash or down the drain. If it will be a regulated hazardous waste, include the cost of disposal when evaluating the costs of using the material.
- (6) Confirm that the school's ventilation system is adequate for using the product safely. Some chemicals need to be handled only in a functioning fume hood. Opening a window does not constitute adequate ventilation. Refer to MSDS for chemical specific information.

B. Steps to take prior to submitting purchase request: *{See Appendix A, Page 44}*

- (1) Review current classroom inventory to avoid duplicate purchases
- (2) Review curriculum to ensure minimal hazardous chemicals are used.
- (3) Generate list of requested chemicals
- (4) Obtain MSDS for any new chemical purchases
- (5) Highlight any hazardous chemicals, if purchase unavoidable

C. Label Compounded Chemicals

- (1) Contents
- (2) Date of generation
- (3) Concentration
- (4) Hazard information
- (5) Name of the responsible person

VII. Storage Considerations

A. Compressed Gas storage and Handling Procedures

- (1) Protecting the cylinder valve stem.
- (2) Procedures for handling chemicals that must be stored away from heat and direct sunlight and properly grounded.
- (3) Method of securing gas cylinders in place to prevent them from falling.

B. Corrosive Materials Storage and Handling Procedures

- (1) Provisions for and identification of corrosives cabinets.
- (2) Requirement for storage in original containers, e.g., acids and bases can be stored in special styrofoam shipping cubes.
- (3) Requirements for eye protection when using corrosive materials.
- (4) Schedule to inspect acid cabinet shelves and shelf supports for corrosion.

C. General Housekeeping Considerations:

- (1) Store all chemicals in a designated, locked and labeled area
- (2) Chemical containers must be isolated (i.e. not be touching) and must be stored no more than 3 containers deep. The Flinn Chemical Catalog Reference Manual suggests organic and inorganic groupings which are further sorted into compatible families *[See Chapter IV, Page 9]*.
- (3) Store flammable chemicals in proper cabinetry. NOTE: A general rule is that controls be in place (or quantities limited) so that the concentration of a flammable will not exceed 25% of the lower explosive limit *[See Chapter IV, Page 9-10]*.
- (4) Do not store chemicals on the floor (except for gas cylinders) or above eye level.
- (5) Do not store food in refrigerators used for chemical storage
- (6) Inspect storage areas routinely (establish specific frequency) for leaks, proper storage practices, and peeling labels.
- (7) Restrict access to chemical storage areas with signage and locks. Students and unauthorized staff must not be allowed in storage areas unsupervised.

D. Handling Drums

- (1) Moving equipment
 - (a) Barrel Cart
 - (b) Forklift or crane
 - (c) Hand truck
- (2) Common hazards in moving drums
 - (a) Back injuries
 - (b) Hand and finger crushing injuries
 - (c) Loose gaskets and bungs
 - (d) Splashes and fumes

VIII. General Guidelines

A. Personal Hygiene Considerations

- (1) Eating, drinking and smoking in chemical use and storage areas.
- (2) The safe use and handling of glassware.
- (3) Engaging in safe laboratory conduct (i.e., avoiding practical jokes and horseplay).
- (4) Controlling personal apparel in the laboratory or whenever chemicals are used.
- (5) Providing appropriate and mandating the use of Protective Personal Equipment (PPE) in and around chemical use and storage areas (i.e. eye protection, glove use, masks, etc.)
- (6) Policy for choosing chemicals appropriate for the available ventilation system.
- (7) Policy against accepting chemical donations or materials that may contain chemicals or traces of chemicals (e.g. soil samples from agricultural fields may contain traces of pesticides or herbicides).

B. General Safety Considerations

- (1) Procedures for hood use and maintenance
- (2) Procedure for handling unattended operations.
- (3) Policy on working alone.
- (4) Waste disposal procedures for each operation that utilizes hazardous materials.
- (5) Housekeeping rules.
- (6) Procedures for handling wastes, including bio-wastes, generated in on-site health office/clinics.

C. Suggested Roles and Responsibilities

- (1) Identify appropriate level (e.g. the Superintendent) - The ultimate responsibility of overseeing that the Chemical Management Plan is enforced and followed continually. He or she will serve as the main champion of the plan for the entire district.
- (2) Identify appropriate level (e.g. the Principal) - Monitor employee compliance with the Chemical Management Plan.
- (3) **Chemical Management Officer (CMO)** - who will annually review chemical inventories and monitor adherence to established policies and procedures. Duties of the CMO may include:
 - (a) Working with administrators and district officials to reduce and dispose of hazardous chemicals within the schools.
 - (b) Maintaining Material Safety Data Sheets (MSDS) for all chemicals stored in the district. Even if the chemical is considered non-toxic the MSDS is a valuable source of information.
 - (c) Ensuring faculty and staff are trained on chemical purchasing, handling, storage, and disposal procedures.
 - (d) Ensuring that proper PPE is available for all students, faculty and school staff that will be working with or around chemicals
 - (e) Staying up to date with hazardous waste storage practices, disposal, and shipping regulations.

- (f) Overseeing all hazardous waste disposals.
 - (g) Carrying out or overseeing annual inventories to make sure chemicals are used and stored properly.
 - (h) Reviewing the Chemical Management plan on an established frequency.
- (4) **Chemical Management Committee (CMC)** - Comprised of 3-5 faculty and staff. Duties may include working with the CMO to:
- (a) Implement the chemical management plan.
 - (b) Review any chemical purchase requests from faculty.
 - (c) Review science curricula annually to ensure the minimization of chemical use and generated waste.
 - (d) Audit the Chemical Management Plan on an established frequency.
- (5) **Faculty/Teachers** - Maintain compliance with proper hazardous chemical use, storage, and disposal procedures and policies. Duties may include:
- (a) Reviewing the Chemical Management Plan on an established frequency and receiving training on using PPE and safety equipment and procedures.
 - (b) Replacing hazardous chemicals with alternatives where suitable.
 - (c) Educating students about proper chemical management, chemical alternatives, and Personal Protective Equipment (PPE).
 - (d) Supervising students when they are around chemicals or in chemical storage areas.
 - (e) Inventorying laboratory chemicals and submitting completed inventories to the CMO and CMC on an established frequency.
 - (f) Inspecting storage areas for leaks, peeling labels, expiration dates, proper segregation and any other problems.
 - (g) Making certain that all chemicals are labeled, handled, stored, and disposed of properly.
 - (h) Submitting purchase requests in a timely manner, and obtain MSDS sheets for any new chemicals being purchased.
 - (i) Ensuring that chemical storage areas are equipped with chemical spill clean-up supplies.
 - (j) Using good classroom chemical management practices

IX. PPE Consideration

A. Performance considerations

- (1) Chemical Resistance - Will clothing maintain its structural integrity and protective qualities?
- (2) Strength - Is material resistant to punctures, tears, or abrasions?
- (3) Flexibility - Dexterity; especially important in gloves
- (4) Thermal limits - Does clothing maintain mobility and protective capacity in temperature extremes?
- (5) Cleanability - Can material be easily cleaned and reused?
- (6) Longevity - Can clothing resist aging?

B. Common Protective Materials

- (1) Butyl rubber - Resists degradation by many contaminants except

halogenated hydrocarbons and petroleum compounds; especially resistant to vapors and gases

(2) Chloropel, CPE or Chlorinated Polyethylene - Used in splash suits and fully encapsulated suits

(3) Natural Rubber - Resist degradation by alcohols and caustics. Used in boots and gloves

(4) Neoprene - Resists degradation by caustics, acids, alcohols and oils. Used in respirator face pieces.

(5) Nitrile - Resist degradation by petroleum compounds, acids, caustics and alcohols; also reasonably good for chlorinated compounds

(6) Nomex (Aromatic polyamide fiber) - Noncombustible and flame resistant up to 220° C. Very durable and acid resistant.

(7) Polyvinyl chloride - Resist degradation by alcohols and caustics. Used in boots and gloves

(8) Saranex (Made of Saran and coated on tyvek) - Very good general purpose disposable material

(9) Tyvek (Spun-bonded non-woven polyethylene fiber) - Has reasonable tear, puncture and abrasion resistance. Relatively inexpensive and suitable for disposable garments

(10) Viton (Fluoroelastomer material similar to Teflon) - Excellent resistance to degradation and permeation of aromatics, chlorinated hydrocarbon and petroleum compounds. Very resistant to oxidizers; but susceptible to degradation by acetone.

C. Protective Level Selection Considerations.

(1) Concentration, type and toxicity of chemical substance in ambient atmosphere.

(2) Exposure potential to airborne substances, splashes of liquids, or other direct contact with material.

D. Care of Eye Protection Equipment

(1) Wash with soap/detergent

(2) Rinse thoroughly with water and air dry

(3) Store in clean location

X. Types of Incompatible Reactions

A. Heat Generation - Acids or Caustics and water

B. Fire - Strong oxidizers and organic materials

C. Explosion - Trichloroethylene and strong alkalis

D. Toxic gas - Cyanides and acids

E. Flammable gas - Acids and metals

F. Polymerization - Ammonia and acrylonitrile

G. Formation of shock sensitive compounds - Picric acid and Heavy Metals.

XI. Handling Exposures and Overexposures

A. Survey Scene and determine:

(1) What happened?

- (2) How many people are injured?
- (3) Are there bystanders who can help?

B. Responding to Overexposures

- (1) Primary Survey (A, B, C's) - Search for life threatening injuries
 - (a) Airway - Is the airway open?
 - (b) Breathing - Is the person breathing?
 - (c) Circulation - Is there a heartbeat? Severe bleeding?
- (2) Secondary Survey - General head-to-toe exam. Is there:
 - (a) Airway obstruction - sign of bleeding
 - (b) Fluid leaking from ears or nose?
 - (c) Pulse or fractures in arms and legs?
 - (d) Abnormalities of the chest or abdomen
 - (e) Sensory feelings - Do they feel your touch?

C. First Aid for over-exposures

- (1) Chemical burns
 - (a) Stop the exposure
 - (b) Refer to first-aid section of MSDS
 - (c) Flush with water 15-30 minutes, if appropriate
 - (d) Remove affected clothing and jewelry
 - (e) Cover area with loose dry bandage
 - (f) Treat for shock
- (2) Shock
 - (a) Place victim on back
 - (b) Elevate feet 8-12 inches; IF AND ONLY IF there is no head, neck or back injury
 - (c) Place victim on side, if vomiting
 - (d) Maintain body temperature; do not overheat
- (3) Poisoning

NOTE: Contact Emergency Medical Services and the Poison Control Center immediately

- (a) Swallowed poison
 - (1) Place victim on side if vomiting
 - (2) Monitor A,B,Cs
 - (3) Save poison container(s) and any vomit
- (b) Inhaled Poison
 - (1) Remove victim from source to fresh air
 - (2) Monitor A,B,Cs
 - (3) Save poison container(s) and any vomit
- (c) Absorbed Poison
 - (1) Remove victim from source of poison
 - (2) Wash or brush poison from skin
 - (3) Remove clothing or affected article

D. Basic information to be provided to emergency responders

- 1. Location of emergency - Address and area within location

2. Telephone number from where the call is being placed
3. Name of caller
4. How many people are injured?
5. Condition of victim(s)
6. What first aid is being administered?
7. Hang up AFTER the emergency responder hangs up - Let responder determine when they have all that they need.

IX. OBTAINING AN EPA IDENTIFICATION NUMBER - EPA FORM 8700-12

Why Must an EPA Form 8700-12 be Submitted to ADEQ?

If you do not currently have an EPA Identification Number and you generate 220 or more pounds of hazardous waste in a single month, you must submit this initial notification form to ADEQ.

If this is a one-time clean out effort, this required notification will be treated as a Provisional Notification; whereby the assigned EPA Identification Number will be temporary, expiring 90 days after issuance. To ensure your provisional status, you must identify yourself as a "short-term generator", (on page 2, Section 10, under Heading 1. Generator of Hazardous Waste), by checking the yes box for Short-Term Generator (10.A.1.d.) and providing an explanation in the comment section on page 4, Section 13.

NOTE: If an EPA ID number has previously been assigned to a particular location, the school must use the previously assigned number and indicate on the EPA Form 8700-12 that this is a Subsequent Notification (i.e. Check second box under Section 1).

Associated Fees:

Please be aware that there are two separate and distinct fees associated with the generation of hazardous wastes; and each fee will be billed separately and retroactively the following year (similar to taxes), as follows:

1. Generation Fee - A Generation Fee Invoice, which is based on the total amount of hazardous waste generated during a clean-out event, on a per ton bases, will be sent out by ADEQ and must be remitted with payment by February 15th of the following year. (Since most transporters provide amount collected in terms of pounds, you will need to convert pounds collected to tons; and 1 ton is equal to 2,000 pounds)

NOTE: Please be aware that registered LQGs will receive Generation Fee Invoices quarterly.

The cumulative weight of all hazardous waste must be entered on the Generation Fee Invoice on line A in order to determine total amount owed.

NOTE: If less than 1 ton of waste has been generated, no fee will be owed; but the information must still be provided on the invoice and the invoice must be submitted to ADEQ by February 15th of the following year.

2. Registration Fee - A Registration Fee Invoice, which registers the generator's status (see definitions below) for a location, will be sent out by ADEQ and must be remitted with payment to ADEQ by March 1st of



EPA form 8700-12

Click here to see the full five-page form, or see page 56.

the following year. The registration fee, which is based on generator status, is broken down as follows:

CESQG - No fee
SQG - \$100
LQG - \$300

Categories of Hazardous Waste Generators:

A. Large Quantity Generator (LQG)- Generates more than 2,200 lb (1,000 kg) of hazardous waste or more than 2.2 lb (1 kg) of acutely hazardous waste in any calendar month or 220 lb (100 kg) of acute spill residue.

B. Small Quantity Generator (SQG)- Generates between 220 lb (100 kg) and 2,200 lb (1,000 kg) of non-acute hazardous waste in any calendar month.

C. Conditionally Exempt Small Quantity Generator (CESQG) - Generates less than 220 lb (100 kg) of non-acute hazardous waste per month.

Section-by-Section instructions for EPA Form 8700-12

Section 1 - Reason for Submittal - Check applicable box (Initial Notification or Subsequent Notification); remaining boxes are not applicable to schools.

Section 2 - Leave blank; unless this is a Subsequent Notification, then provide existing EPA ID Number.

Section 3 - Site Name (Actual school name, not name of District).

Section 4- Site Address (Physical location of school, not District office).

Section 5 - Site Land Type (Is property owned by private entity or District, state, County, etc.).

Section 6 - NAICS Code - (Google search - NAICS High School, Middle school, Elementary school, Charter school, as applicable, to obtain appropriate NAICS Code).

Section 7- Site Mailing Address - Where should correspondences be mailed (District office or School administrator as applicable).

Section 8 - Site Contact Person (Identify on-site person with responsibility or control of Chemical Management).

Section 9 (a) - Property Owner (Legal property owner as listed in County Assessors records and the actual date ownership became effective).

Section 9 (b) - Site Operator (Name of organization, not an individual

employed by organization; and date organization took control of facility).

Section 10 - Type of Regulated Waste Activity (i.e. Identify Generator Status (see definitions above)).

Subsection A.1 - Hazardous Waste Activities identify generator status.

NOTE: Check the yes box under “d” for Short-Term Generator, if this is a Provisional Notification (See discussion above).

A.2 - Transporter (must check yes or no)

A.3 - TSDF (must check yes or no)

A.4 - Recycler (must check yes or no)

A.5 - Exempt Boiler/Industrial Furnace (must check yes or no)

A.6 - Underground Injection Control (must check yes or no)

A.7 - Receives Hazardous Waste off-site (must check yes or no)

Subsection B.1 - Large Quantity Handler of Universal Waste

NOTE: If you check any of the boxes listed in a-g, the EPA system will default this section of your Notification to a yes. It is imperative that you only check boxes a-g if the cumulative total of all universal waste meets or exceeds the 5,000 kg threshold.

B.2 - Destination Facility (must check yes or no)

Subsection C.1 - Used Oil Transporter (must check yes or no)

C.2 - Used Oil Processor/Re-refiner (must check yes or no)

C.3 - Off-Specification Used Oil Burner (must check yes or no)

C.4 - Used Oil Fuel Marketer (must check yes or no).

Subsection D - Eligible Academic Entities with Laboratories (Applies only to college or university related establishments).

NOTE: Leave blank for K-12 schools.

Section 11 - Description of Hazardous Waste

Subsection A - Federal waste codes for substance (obtain waste codes from MSDS or internet search; this information should already be captured in the Hazard Identification column of the worksheet).

Subsection B - Arizona does not have State-specific codes, therefore this section does not apply; leave blank.

Section 12 - Notification of Hazardous Secondary Material

NOTE: unlikely to apply to schools; but yes or no must be checked.

Section 13 - Comments. Include all relevant comments, including discussion on why this notification is a Provisional Notification.

Section 14 - Certification. An original signature and printed name and

title from a person authorized to legally obligate the organization must be submitted and received by ADEQ before the notification form can be processed and an EPA ID number is assigned. Photocopied, scanned or faxed copies can not be accepted.

Addendum

Sections 1 and 2 must be left blank if the school does not manage secondary material.

Section 3 must be completed indicating whether the school has financial assurance. Financial assurance is not required if the school does not manage secondary material.

Mail all correspondence to:

Arizona Department of Environmental Quality

1110 West Washington Street, Mail Code 4415 A-1

Phoenix, AZ 85007

X. GLOSSARY

Acid: A substance that dissolves in water and releases hydrogen ions (H^+); acids cause irritation, burns, or more serious damage to tissue, depending on the strength of the acid, which is measured by pH.

Acute toxicity: Adverse effects resulting from a single dose, or exposure to a substance for less than 24 hours.

Asphyxiant: A substance that interferes with the transport of an adequate supply of oxygen to the body by either displacing oxygen from the air or combining with hemoglobin, thereby reducing the blood's ability to transport oxygen.

Base: A substance that dissolves in water and releases hydroxide ions (OH^-); bases cause irritation, burns, or more serious damage to tissue, depending on the strength of the base, which is measured by pH.

Carcinogen: A substance that causes cancer.

CAS Registry number or CAS Number: An internationally recognized unique registration number assigned by the Chemical Abstracts Service to a chemical, a group of similar chemicals, or a mixture.

Chronic toxicity: Adverse effects resulting from repeated doses of, or exposures to, a substance by any route for more than three months.

Combustible liquid: A liquid with a flashpoint at a temperature lower than the boiling point; according to the National Fire Protection Association and the U.S. Department of Transportation, it is a liquid with a flash point of 100 °F (37.8 °C) or higher.

Compatible materials: Substances that do not react together to cause a fire, explosion, violent reaction or lead to the evolution of flammable gases or otherwise lead to injury to people or danger to property.

Compressed gas: A substance in a container with an absolute pressure greater than 276 kilopascals (kPa) or 40 pounds per square inch (psi) at 21 °C, or an absolute pressure greater than 717 kPa (40 psi) at 54 °C.

Corrosive: A substance capable of causing visible destruction of, and/or irreversible changes to living tissue by chemical action at the site of contact (i.e., strong acids, strong bases, dehydrating agents, and oxidizing agents).

Explosive: A substance that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

Exposure limits: The concentration of a substance in the workplace to which most workers can be exposed during a normal daily and weekly work schedule without adverse effects.

Flammable: A substance having a flashpoint above 20 °F (−6.7 °C) and below 100 °F (37.8 °C). An extremely flammable substance, is any substance with a flashpoint at or below 20 °F (−6.7 °C).

Flashpoint: The minimum temperature at which a liquid or a solid produces a vapor near its surface sufficient to form an ignitable mixture with the air; the lower the flash point, the easier it is to ignite the material.

Hazardous substance: Any substance or mixture of substances that is toxic, corrosive, an irritant, a strong sensitizer, flammable or combustible,

or generates pressure through decomposition, heat, or other means, if it may cause substantial personal injury or illness during or as a proximate result of any customary or reasonably foreseeable handling or use, including reasonably foreseeable ingestion by children.

Hepatotoxin: A chemical that can cause liver damage.

Ignitable: A substance capable of bursting into flames; an ignitable substance poses a fire hazard.

Incident: Any undesired or unplanned event which results in an unintended consequence, physical injury or damage of property, or the possibility of such injury or damage. Incidents do not necessarily result in injuries.

Incompatible materials: Substances that can react to cause a fire, explosion, violent reaction or lead to the evolution of flammable gases or otherwise lead to injury to people or danger to property.

Ingestion: Taking a substance into the body by mouth and swallowing it.

Inhalation: Breathing a substance into the lungs; substance may be in the form of a gas, fume, mist, vapor, dust, or aerosol.

Irritant: A substance that causes a reversible inflammatory effect on living tissue by chemical action at the site of contact.

Known human carcinogen: A substance for which there is sufficient evidence of a cause and effect relationship between exposure to the material and cancer in humans.

LC50 (Median Lethal Concentration 50): The concentration of a chemical that kills 50% of a sample population; typically expressed in mass per unit volume of air.

LD50 (Median Lethal Dose 50): The amount of a chemical that kills 50% of a sample population; typically expressed as milligrams per kilogram of body weight.

Mutagen: A substance capable of changing genetic material in a cell.

Neurotoxin: A substance that induces an adverse effect on the structure and/or function of the central and/or peripheral nervous system.

Oxidizer: A substance that causes the ignition of combustible materials without an external source of ignition; oxidizers can produce oxygen, and therefore support combustion in an oxygen free atmosphere.

Peroxide former: A substance that reacts with air or oxygen to form explosive peroxy compounds that are shock, pressure, or heat sensitive.

Permissible Exposure Limit (PELs): The legally enforceable maximum amount or concentration of a chemical that a worker may be exposed to under OSHA regulations.

Personal Protective Equipment (PPE): Any clothing and/or equipment used to protect the head, torso, arms, hands, and feet from exposure to chemical, physical, or thermal hazards.

pH: A measure of the acidity or basicity (alkalinity) of a material when dissolved in water; expressed on a scale from 0 to 14.

Radioactive material: A material whose nuclei spontaneously give off nuclear radiation.

Reactivity: The capacity of a substance to combine chemically with other substances.

Reproductive toxicity: Adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in the offspring

Secondary containment: An empty chemical-resistant container/dike placed under or around chemical storage containers for the purpose of containing a spill should the chemical container leak.

Short-Term Exposure Limit (STEL): The maximum concentration to which workers can be exposed for a short period of time (15 minutes).

Systemic: Affecting many or all body systems or organs; not localized in one spot or area.

Teratogen: A substance which may cause non-heritable genetic mutations or malformations in the developing embryo or fetus when a pregnant female is exposed to the substance.

Threshold Limit Value (TLV): Term used to express the recommended exposure limits of a chemical to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

Time-Weighted Average (TWA): The average concentration to which an average worker can be exposed for a normal, 8-hour workday.

Toxic substance: In general, any substance (other than a radioactive substance) that has the capacity to produce personal injury or illness to man through ingestion, inhalation, or absorption through any surface of the body.

Water reactive material: A substance that reacts with water that could generate enough heat for the item to spontaneously combust or explode. The reaction may also release a gas that is either flammable or presents a health hazard.

XI. SAMPLE INVENTORY INTERVIEW QUESTIONS

Administrators and Faculty:

1. How are chemicals used in your school? (i.e. science, cleaning, home economics) Which chemicals? Where and how are they stored?
2. How are chemicals disposed of? How often are chemicals disposed of?
3. How do you decide what chemicals to use in the school?
4. Who purchases chemicals and how often? How are chemicals distributed through the school?
5. How would you describe communication between your school and the district office regarding chemicals and purchasing? Is it clear and effective?
6. Has your school been involved in any chemical reduction or other environmental projects? If so, what and when? Are they still being implemented?
7. How do you train your staff (custodians, teachers, maintenance and administrators) on proper chemical usage, storage and disposal? Who conducts these trainings and how often?
8. Are you interested in participating in additional chemical reduction and/or environmental programming?
9. Can you provide any information about energy use, water use or additional information about chemical use in your school?

Custodial Staff:

1. Do you and the other custodians use gloves and masks when working with toxic cleaning supplies? Is the use of safety equipment enforced, or is it optional?
2. Do you receive training on use, storage and disposal of cleaning products? If you do, who conducts these trainings and how often? Are they effective? Do they provide training in your native language? Apart from current trainings provided, what other trainings are you interested in attending?
3. Are all of your equipment functional, specifically dispensers/dilution equipment? If your equipment is broken, for how long has it been broken and has the problem been reported to administration?
4. Where are gasoline and other flammable substances stored? Can you show us the storage facilities for these substances? Do you have any concerns about the storage of these substances? Have there been any past incidents surrounding the storage and use of flammable substances?
5. Do you or other custodians have reactions from the cleaning supplies you use (ex. rash, irritated eyes, trouble breathing)? Which cleaning supplies cause the irritation? Are these problems reported to administration?
6. Do you use any particularly toxic cleaning supplies? If so, when do you use these chemicals (during school hours or after school)?
7. Are there any expired or unused substances stored in your areas? If so, can you show us where the expired chemicals are stored?
8. Are the proper storage facilities provided to your staff for different types of cleaning supplies? Do you feel you have adequate storage space?
- 9.- Are there chemicals being stored in rooms with electrical devices (i.e. breakers, transformes, etc.) at your school?

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XII. APPENDICES

Appendix A

CHEMICAL PURCHASING JUSTIFICATION FORM		
Requestor:	Phone:	Email:
School:	Dept:	Room:
MSDS Attached: <input type="checkbox"/> Yes <input type="checkbox"/> No	If not, why not?	
Product name:	Manufacturer:	
Container size:	Proposed storage location:	
Maximum quantity (# of containers):	Average quantity (per container):	
Mission-Critical activity description (Why is this chemical necessary?):		
How and where will this product be used? (Maintenance, construction, lab experiments, pest control, etc.)		
Less toxic or hazardous substitute was not procured because it is not available (select all that apply): <input type="checkbox"/> Within a reasonable timeframe <input type="checkbox"/> At a reasonable price <input type="checkbox"/> Within performance requirements <input type="checkbox"/> Other (explain):		
Provide a detailed justification and attach supporting documentation for each indicated reason:		
Are special handling or storage procedures, beyond existing capabilities, needed? <input type="checkbox"/> Yes <input type="checkbox"/> No Explain why or why not:		
Are special training requirements or spill response materials needed? <input type="checkbox"/> Yes <input type="checkbox"/> No Explain why or why not:		
When discarded, will the waste be regulated as a hazardous waste? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, is the school equipped to store the waste appropriately until picked up by permitted contractor?		
Review by Chemical Management Officer (CMO)		
I have verified:		
<input type="checkbox"/> Product is not a banned substance <input type="checkbox"/> Proper PPE is available for students, faculty and staff <input type="checkbox"/> Existing response procedures and equipment are sufficient for this product	<input type="checkbox"/> School's ventilation system is adequate for using this product safely <input type="checkbox"/> Waste disposal costs are reasonable	
I recommend this request be: <input type="checkbox"/> Approved <input type="checkbox"/> Denied Comments:		
Chemical Management Committee (CMC) Decision		
<input type="checkbox"/> Approved		
<input type="checkbox"/> Conditionally Approved (Provide discussion on any imposed limitations/restrictions. Conditions may include limiting the quantity; restricting use to a specific area, project or process; imposing stringent guidelines for its storage or use; etc.)		
<input type="checkbox"/> Denied (Provide justification for denial. Justification may include product is not for mission critical purpose; a less hazardous substitute is available; associated risks outweigh potential benefit; etc.)		

Appendix B

HAZARDOUS WASTE GENERATOR SIZE CLASSES			
	CESQG (Conditionally Exempt Small Quantity Generator)	SQG (Small Quantity Generator)	LQG (Large Quantity Generator)
Monthly Generation Rate	Monthly hazardous waste generation of less than 220 lbs ($\leq 100\text{kg/mo}$) Or monthly acute hazardous waste generation less than 2.2 lbs ($\leq 1\text{kg/mo}$)	Monthly hazardous waste generation greater than 220 lbs but less than 2,200 lbs ($> 100\text{kg/mo}$ but $\leq 1000\text{ kg/mo}$)	Monthly hazardous waste generation greater than 2,200 lbs ($> 100\text{ kg/mo}$) Or monthly acute hazardous waste generation greater than 2.2 lbs ($> 1\text{kg/mo}$)
Maximum Amount Stored	Store less than 2,200 lbs on-site at any time (total acute and non-acute)	Store less $\leq 13,228$ lbs (total acute + non-acute)	No amount limit but less than 20,000kg for F006 waste
Storage Time Limit	No Time Limit	No more than 180 days	No more than 90 days
General Reference	40 CFR § 261.5	40 CFR § 262.34 (d) & (e)	40 CFR § 262.34 (a) & (b)
Helpful Conversions	100 kg \approx 220 lbs 1 gallon of water \approx 8.34 lbs 100kg \approx 220lbs \approx ½ 55 gallon container of water weight 1 kg \approx 2.2 lbs (Acute)	For an SQG approximately $> \frac{1}{2}$ 55-gallon container but less than 5 55-gallon containers of water weight	1000 kg \approx 2,200 lbs 1 gallon of water \approx 8.34 lbs 1000kg \approx 2,200lbs \approx Approximately 5 55-gallon containers of water weight 1 kg \approx 2.2 lbs (Acute)
* Note: Keep in mind that the specific weight of water is used as an example to determine generator class. Not all chemicals have the same weights per gallon; various chemicals have a different specific gravity such as lead which is 94.659 pounds per gallon.			

Appendix C

GENERATOR CLASS COMPARISON CHART			
	CESQG (Conditionally Exempt Small Quantity Generator)	SQG (Small Quantity Generator)	LQG (Large Quantity Generator)
EPA ID Number	Not required, but recommended	Required (3010; 8700-12 form)	Required (3010; 8700-12 form)
ADEQ Registration and Generation Fees	Not required	Required Annual Invoice	Required Annual Invoice
	No fees	\$100 Annual Registration Fee	\$300 Annual Registration Fee
		\$67.50 per ton generation fees for off-site shipment	\$67.50 per ton generation fees for off-site shipment
		- Annual Payments	- Quarterly Payments
Facility Annual Report (FAR)	Limited information required on ADEQ FAR short form, if facility has an EPA ID number	Limited information required on ADEQ FAR short form.	Required Federal Long Form {A.A.C. R18-8-262H} EPA Form 8700-13
Exception Report	Not Required	Required after 60 Days [40 CFR §262.42(b)]	Required after 45 Days [40 CFR §262.42(a)(2)]
Personnel Training	Not Required	Basic Training	Required [40 CFR §265.16]
Preparedness and Prevention	Not Required	Required	Required [40 CFR §265 Subpart C]
Contingency Plan	Not Required	Basic emergency response information and procedures posted by facility phone.	Full Plan Required [40 CFR §265 Subpart D]
Manifest	Not Required	Required	Required
Satellite Containers	Not applicable	Allowed	Allowed
Storage Requirements	Limited requirements.	Comply with technical standards under 40 CFR §265 Subpart I for containers	Comply with technical standards under 40 CFR §265 Subpart I for containers
	Identify all hazardous waste; comply with quantity limits; ship to approved hazardous waste facility; do not discharge	Comply with reduced 40 CFR §265 Subpart I for tanks	Comply with full 40 CFR §265 Subpart I for tanks
General Reference	40 CFR §261.5	40 CFR §262.34(d)&(e)&(f)	40 CFR §262.34(a)&(b)

Appendix D

Hazardous waste is any solid waste that either exhibits any of the characteristics of hazardous waste or is a listed EPA Waste. Below are tables breaking down the differences.

EPA HAZARDOUS WASTE CHARACTERISTICS AND CODES

Ignitable (D001)	- It is a liquid and has a flash point of less than 60° C (140°)
	- Not a liquid but causes fire through friction, absorption of moisture or spontaneous chemical changes
	- Ignitable compressed gas
Corrosive (D002)	- pH is less than 2 and greater or equal to 12.5
	- Corrodes steel at a rate greater than 6.35mm per year
Reactive (D003)	- Normally unstable and can cause explosions, and/or reactive gases or vapors when heated, compressed, or mixed with water
Toxicity (D004-D043)	- Exhibits the characteristics of toxicity, using the Toxicity Characteristics Leaching Procedure (TCLP) test Method 1311

LISTED HAZARDOUS WASTE

F-List	This list is known as wastes from nonspecific sources, designates particular solid wastes from certain common industrial or manufacturing processes as hazardous. Waste from these processes occurring in various sectors of industry. {40 CFR § 261.31}
K-List	Designates particular solid wastes from certain specific industries as hazardous known as wastes from specific sources. {40 CFR §261.32}
P and U List	P and U lists list pure or commercial grade formulations of certain specific unused chemicals as hazardous. {40 CFR §261.33}

EPA Hazardous Waste Codes are also classified as acute and non-acute. Acute hazardous waste includes all P and U listed wastes and six F-listed wastes: F020, F021, F022, and F023, F026, and F027. Acute hazardous wastes are considered so dangerous that 2.2 pounds generated in any one calendar month will make you a large quantity generator (LQG) which yields far more stringent rules and regulations.

* Note: Must contain constituent a sole-active ingredient and be unused or discarded.

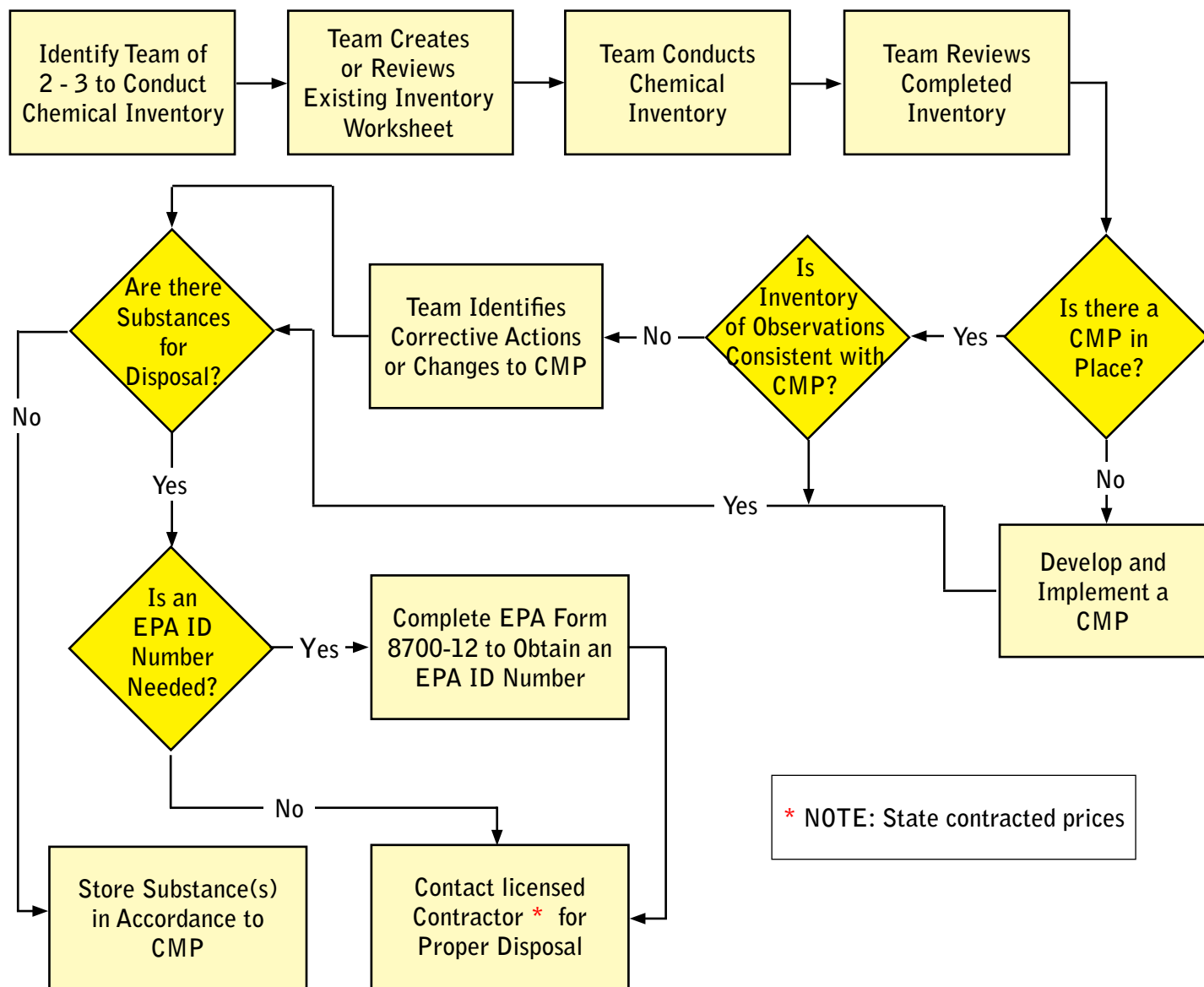
Explanation on the sole active ingredient

A waste is regulated as a P-listed waste only if the ingredient contained in the list is the sole active ingredient of the product that became a waste. Active ingredients are those ingredients that perform the function of the product without limits to the concentration of those ingredients. For example, nicotine patches are regulated as RCRA hazardous waste P075 waste when unused such as nicotine patches, nicotine gum, and lozenges. Also ingredients such as sodium azide is the sole ingredient in a broad range of pesticides and would be listed as P105 if disposed of as unused. However, some airbags contain both sodium azide and oxidizers as active ingredients this would not count as a P-listed waste when disposed of since the sole active ingredient was not sodium azide

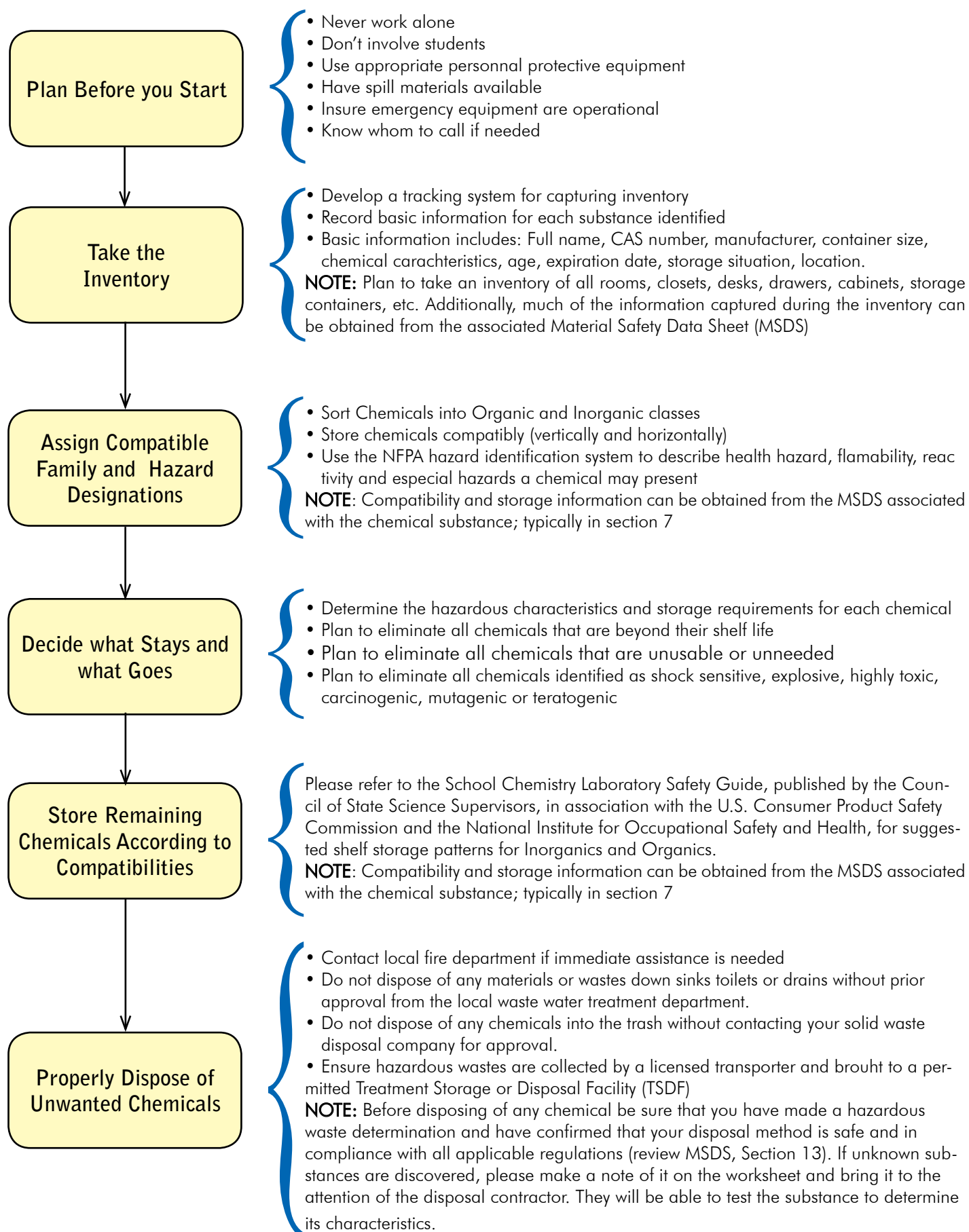
Appendix E

MAXIMUM CONCENTRATION OF CONTAMINANTS FOR THE TOXICITY CHARACTERISTIC					
EPA Hazardous Waste Number	Contaminant	Regulatory Level (mg/L)	EPA Hazardous Waste Number	Contaminant	Regulatory Level (mg/L)
D004	Arsenic	5	D032	Hexachlorobenzene	0.13
D005	Barium	100	D033	Hexachlorobutadiene	0.5
D018	Benzene	0.5	D034	Hexachloroethane	3
D006	Cadmium	1	D008	Lead	5
D019	Carbon tetrachloride	0.5	D013	Lindane	0.4
D020	Chlordane	0.03	D009	Mercury	0.2
D021	Chlorobenzene	100	D014	Methoxychlor	10
D022	Chloroform	6	D035	Methyl ethyl ketone	200
D007	Chromium	5	D036	Nitrobenzene	2
D023	Cresol, o-	200	D037	Pentachlorophenol	100
D024	Cresol, m-	200	D038	Pyridine	5
D025	Cresol, p-	200	D010	Selenium	1
D026	Cresol	200	D011	Silver	5
D016	2,4-D	10	D039	Tetrachloroethylene	0.7
D027	Dichlorobenzene, 1,4-	7.5	D015	Toxaphene	0.5
D028	Dichloroethane, 1,2-	0.5	D040	Trichloroethylene	0.5
D029	Dichloroethylene, 1,1-	0.7	D041	2,4,5-Trichlorophenol	400
D030	Dinitrotoluene, 2,4-	0.13	D042	2,4,6-Trichlorophenol	2
D012	Endrin	0.02	D017	2,4,5-TP (Silvex)	1
D031	Heptachlor (and its epoxide)	0.008	D043	Vinyl Chloride	0.2

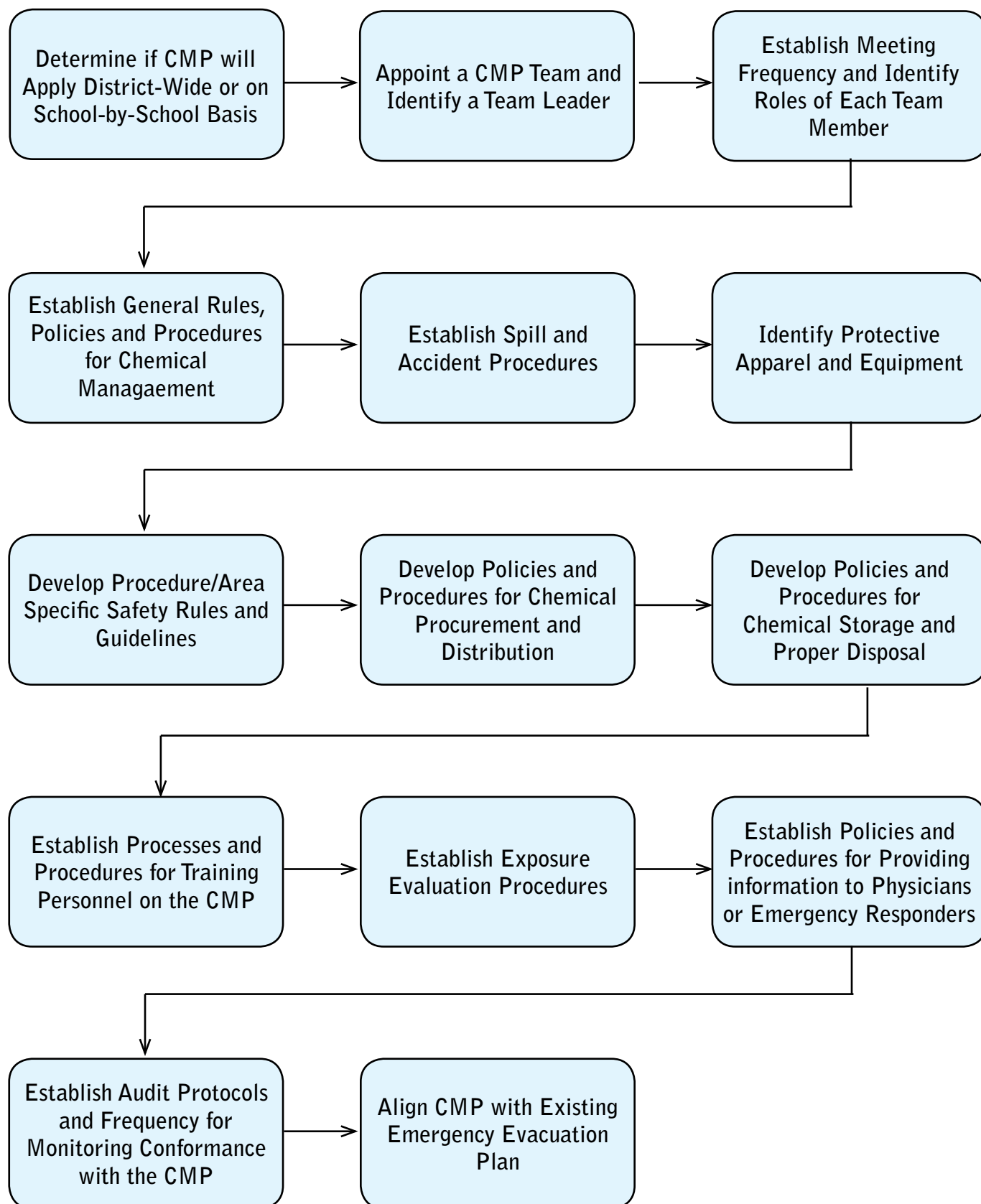
Appendix F - SCHOOL CHEMICAL CLEAN-OUT OVERVIEW



Appendix G - CONDUCTING A CHEMICAL INVENTORY



Appendix H - CREATING A SCHOOL CHEMICAL MANAGEMENT PLAN (CMP)



Appendix I (Page 1)- BEST ASSESSMENT PRACTICES (BAPs)

This document outlines best practices for assessment and design of a school district chemical reduction initiative. Reflections are outlined from planning through execution, and are based on the experiences of BARA field researchers working with a small Arizona school district (approximately 6000 students) in 2012. Depending on the circumstances of the selected district and the nature of the chemical reduction project being designed and implemented, different steps of the process will be more or less relevant.

General Approach

- Allow school administrators, faculty, parents and students to help explore the issues that are most important in their school communities.
- Recognize past programs and experiences as a baseline for best and worst practices regarding chemical management and environmental health in district schools.
- Recognize the linkages between individuals, their families, and the communities in which they live and learn.
- Consider attainable goals within budget and time constraints.

Scoping

- Start the assessment process by using available resources to conduct primary research. Being fully informed will serve you well in initial interactions and relationship building. Be sure to include the following topics in scoping research: (1) demographics, (2) state regulations on children's environmental health, (3) school district policies for chemical use, disposal, management, storage and purchasing, (4) personnel responsible for chemical management, (5) past chemical incidents, (6) environmental education and (7) energy and water use.
- Make a detailed contact list for schools in the district, including address, principal, phone, fax, and other relevant information.
- Develop a set of interview questions, organized topically, to use in scoping interviews. Pilot your questions in the first one or two interviews and then streamline the questions for all following interviews. It is beneficial to develop different sets of questions depending for people in different positions within the schools (administrators, teachers, maintenance staff) and to incorporate questions that gather data on perceptions and knowledge.
- Prepare and distribute an informational handout explaining the purpose and goals of the project.
- If you are an outside agency/organization: Before approaching district officials, send an initial letter to the superintendent to request permission to visit schools to conduct interviews and guided discussions with faculty and staff.

Inventory

- Conducting inventories of custodial, maintenance, kitchen and science facilities is time consuming, sometimes restrictively so. To avoid falling behind on the project timeline, streamline the inventory process. Pilot an inventory at one or two schools (preferably with different characteristics and storage facilities to ensure an accurate sample). Based on your findings and the information necessary for the contractor (see “Removal of Hazardous Chemicals”), remove unneeded fields and refine your list of substances to be included in inventory lists.
- If purchasing is centrally managed, most schools will use the same chemicals. After the first few inventories, develop an alphabetized list of hazardous substances found in the schools. Use the list to search, copy and paste individual substances into subsequent inventories to save time and avoid re-recording substance information.
- Use a laptop or develop a system of shorthand to conduct the inventory quickly and accurately. Convert your shorthand to a full inventory shortly after the inventory is conducted to ensure accuracy.
- Being efficient recording inventories will give you more time to collect critical information from school personnel on use, management and disposal practices. In general, it will give you more time to build relationships and uncover nuanced issues related to perception, knowledge and practice.
- If you are working in the U.S.-Mexico border region, make sure to bring a research associate who speaks Spanish conversationally.
- To make an accurate estimate for the cost of removal, the contractor will require bottle size and number of containers.

District Involvement

- District personnel are your gateway into individual schools and will decide whether to grant access to critical information. As such, remind yourself that these individuals are important allies in the chemical reduction process. They have the power to mobilize resources and people and should be respected for their expertise and opinions.
- Be aware of and plan around the district’s academic calendar. Avoid planning visits during testing and other busy periods.
- Communicate with district officials the importance of partnership. They are responsible for implementing the chemical management plan once it is developed. Intimate partnership with the district will also build knowledge among district personnel to make management of hazardous substances sustainable.

Removal of Hazardous Chemicals

- Ultimately, in conjunction with district policies, it is each school's decision about what chemicals need to be removed. However, be aware there are chemicals that should never be present within a school (see EPA List of Acute Hazardous Wastes).
- Obtain an EPA ID # for schools anticipating chemical removal.
- Schools should try to compile all substances for a one-time removal to reduce future expenses.
- Fill the containers provided by the contractor completely in order to take full advantage of the service.
- Schools should remove all of the following chemicals:
 - organic acids
 - oxidizers
 - metal powders
 - all radioactive material
 - carcinogens
 - mercury
 - cyanides
 - lead

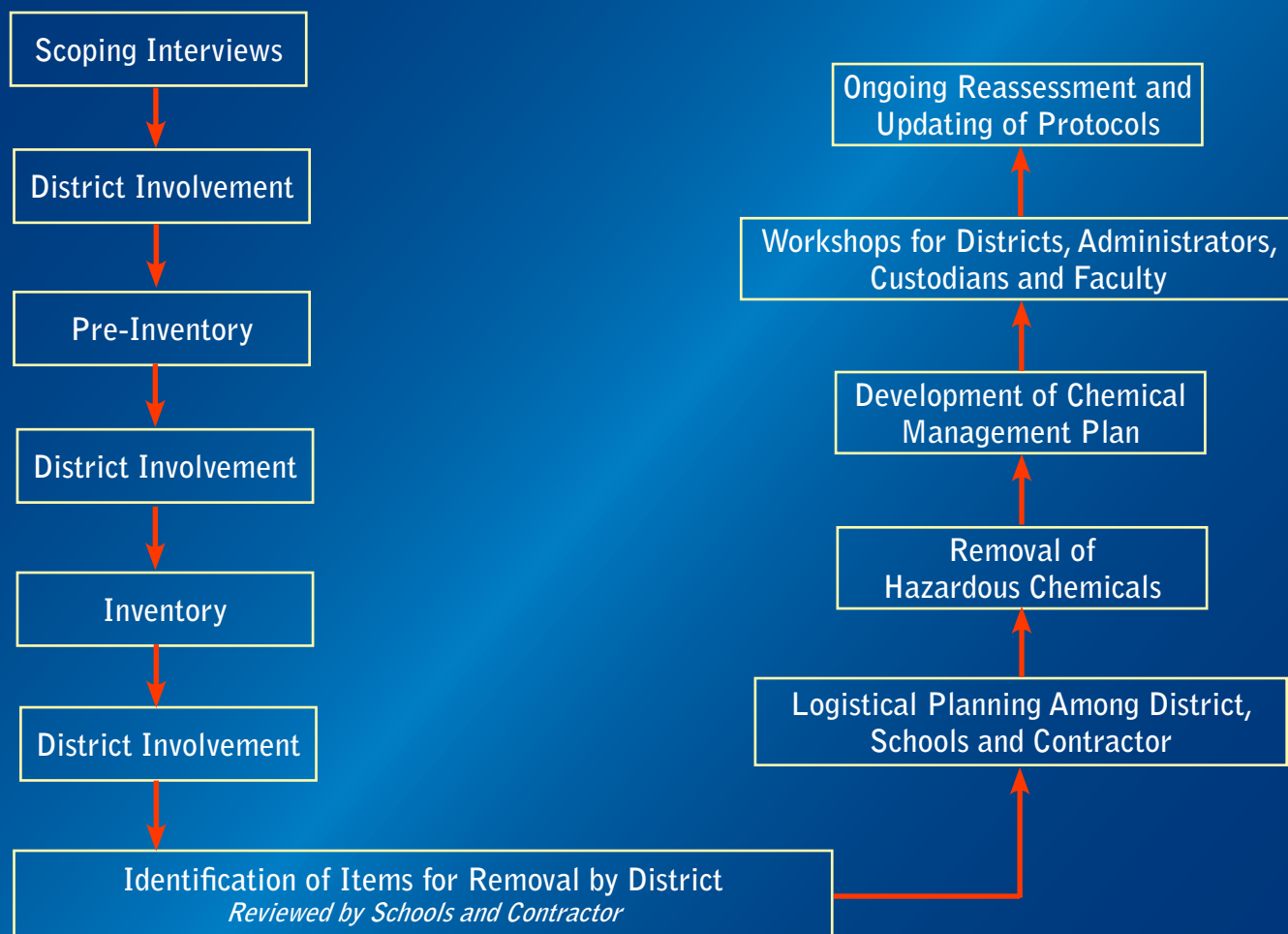
Chemical Management Plan

- Needs and conditions will vary district-by-district. To make sure your efforts to create a chemical management plan are broadly applicable, begin with a template that leaves room for district- and state-specific information. The district can then fill out the specific fields.
- Designate an individual(s) to be responsible for overseeing chemicals in the schools and at all levels within the district.
- Be aware of current emergency response plans and staff training information to avoid repetitive instruction.
- Communicate to teachers and administrators that there are chemicals they cannot store at anytime in the school. Teachers are often concerned that they have, or will have, limited funds for future purchasing. However, it is important for teachers to know there are restrictions regarding storage and shelf life, quantities of substances, and damaged containers.
- For science classes, create individual Standard Operating Procedure (SOP) and Personal Protective Equipment information for each experiment based on the chemicals being used.
- Note: Phoenix area schools have 'Good Risk Managers,' which are designated individuals within the school responsible for collecting and storing chemicals for removal. Some schools and community colleges have a cleanout every year.

Workshops


- Considering the varied interactions of different school actors with hazardous chemicals, provide independent workshops for each of the following groups, geared to their specific needs: district officials, administrators, custodians, science teachers, and general faculty.
- The workshop for district officials can be conducted through the drafting of a chemical management plan specific to their district.
- To maximize on efficiency, teacher workshops can be held during the pre-service before school starts.

Diagram of a Chemical Reduction Assessment Process



Appendix J (Page 1) - EPA FORM 8700-12

OMB# 2050-0024; Expires 11/30/2011

SEND COMPLETED FORM TO: The Appropriate State or Regional Office.	United States Environmental Protection Agency RCRA SUBTITLE C SITE IDENTIFICATION FORM																							
1. Reason for Submittal MARK ALL BOX(ES) THAT APPLY	Reason for Submittal: <input type="checkbox"/> To provide an Initial Notification (first time submitting site identification information / to obtain an EPA ID number for this location) <input type="checkbox"/> To provide a Subsequent Notification (to update site identification information for this location) <input type="checkbox"/> As a component of a First RCRA Hazardous Waste Part A Permit Application <input type="checkbox"/> As a component of a Revised RCRA Hazardous Waste Part A Permit Application (Amendment # _____) <input type="checkbox"/> As a component of the Hazardous Waste Report (If marked, see sub-bullet below) <input type="checkbox"/> Site was a TSD facility and/or generator of $\geq 1,000$ kg of hazardous waste, >1 kg of acute hazardous waste, or >100 kg of acute hazardous waste spill cleanup in one or more months of the report year (or State equivalent LQG regulations)																							
2. Site EPA ID Number	EPA ID Number <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>																							
3. Site Name	Name: <input type="text"/>																							
4. Site Location Information	Street Address: <input type="text"/> City, Town, or Village: <input type="text"/> County: <input type="text"/> State: <input type="text"/> Country: <input type="text"/> Zip Code: <input type="text"/>																							
5. Site Land Type	<input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other																							
6. NAICS Code(s) for the Site (at least 5-digit codes)	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">A. <input type="text"/></td> <td style="width: 50%;">C. <input type="text"/></td> </tr> <tr> <td>B. <input type="text"/></td> <td>D. <input type="text"/></td> </tr> </table>			A. <input type="text"/>	C. <input type="text"/>	B. <input type="text"/>	D. <input type="text"/>																	
A. <input type="text"/>	C. <input type="text"/>																							
B. <input type="text"/>	D. <input type="text"/>																							
7. Site Mailing Address	Street or P.O. Box: <input type="text"/> City, Town, or Village: <input type="text"/> State: <input type="text"/> Country: <input type="text"/> Zip Code: <input type="text"/>																							
8. Site Contact Person	First Name: <input type="text"/> MI: <input type="text"/> Last: <input type="text"/> Title: <input type="text"/> Street or P.O. Box: <input type="text"/> City, Town or Village: <input type="text"/> State: <input type="text"/> Country: <input type="text"/> Zip Code: <input type="text"/> Email: <input type="text"/> Phone: <input type="text"/> Ext.: <input type="text"/> Fax: <input type="text"/>																							
9. Legal Owner and Operator of the Site	<table border="1" style="width: 100%;"> <tr> <td colspan="2">A. Name of Site's Legal Owner:</td> <td>Date Became Owner:</td> </tr> <tr> <td colspan="3">Owner Type: <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other</td> </tr> <tr> <td colspan="3">Street or P.O. Box: <input type="text"/></td> </tr> <tr> <td colspan="2">City, Town, or Village: <input type="text"/></td> <td>Phone: <input type="text"/></td> </tr> <tr> <td colspan="2">State: <input type="text"/></td> <td>Zip Code: <input type="text"/></td> </tr> <tr> <td colspan="2">B. Name of Site's Operator:</td> <td>Date Became Operator:</td> </tr> <tr> <td colspan="3">Operator Type: <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other</td> </tr> </table>			A. Name of Site's Legal Owner:		Date Became Owner:	Owner Type: <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other			Street or P.O. Box: <input type="text"/>			City, Town, or Village: <input type="text"/>		Phone: <input type="text"/>	State: <input type="text"/>		Zip Code: <input type="text"/>	B. Name of Site's Operator:		Date Became Operator:	Operator Type: <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other		
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Operator Type: <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other																								

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10. Type of Regulated Waste Activity (at your site)

Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities; Complete all parts 1-7.

Y ☐ N ☐

1. Generator of Hazardous Waste

If "Yes", mark only one of the following – a, b, or c.

- ☐ a. LQG: Generates, in any calendar month, 1,000 kg/mo (2,200 lbs./mo.) or more of hazardous waste; **or** Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lbs./mo) of acute hazardous waste; **or** Generates, in any calendar month, or accumulates at any time, more than 100 kg/mo (220 lbs./mo) of acute hazardous spill cleanup material.
- ☐ b. SQG: 100 to 1,000 kg/mo (220 – 2,200 lbs./mo) of non-acute hazardous waste.
- ☐ c. CESQG: Less than 100 kg/mo (220 lbs./mo) of non-acute hazardous waste.

If "Yes" above, indicate other generator activities.

Y ☐ N ☐

d. Short-Term Generator (generate from a short-term or one-time event and not from on-going processes). If "Yes", provide an explanation in the Comments section.

Y ☐ N ☐

e. United States Importer of Hazardous Waste

Y ☐ N ☐

f. Mixed Waste (hazardous and radioactive) Generator

Y ☐ N ☐

2. Transporter of Hazardous Waste

- If "Yes", mark all that apply.
- ☐ a. Transporter
- ☐ b. Transfer Facility (at your site)

Y ☐ N ☐

3. Treater, Storer, or Disposer of Hazardous Waste

Note: A hazardous waste permit is required for these activities.

Y ☐ N ☐

4. Recycler of Hazardous Waste

Y ☐ N ☐

5. Exempt Boiler and/or Industrial Furnace

- If "Yes", mark all that apply.
- ☐ a. Small Quantity On-site Burner Exemption
- ☐ b. Smelting, Melting, and Refining Furnace Exemption

Y ☐ N ☐

6. Underground Injection Control

Y ☐ N ☐

7. Receives Hazardous Waste from Off-site

B. Universal Waste Activities; Complete all parts 1-2.

Y ☐ N ☐

1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) [refer to your State regulations to determine what is regulated]. Indicate types of universal waste managed at your site. If "Yes", mark all that apply.

- a. Batteries ☐
- b. Pesticides ☐
- c. Mercury containing equipment ☐
- d. Lamps ☐
- e. Other (specify) _____ ☐
- f. Other (specify) _____ ☐
- g. Other (specify) _____ ☐

Y ☐ N ☐

2. Destination Facility for Universal Waste

Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities; Complete all parts 1-4.

Y ☐ N ☐

1. Used Oil Transporter

- If "Yes", mark all that apply.
- ☐ a. Transporter
- ☐ b. Transfer Facility (at your site)

Y ☐ N ☐

2. Used Oil Processor and/or Re-refiner

- If "Yes", mark all that apply.
- ☐ a. Processor
- ☐ b. Re-refiner

Y ☐ N ☐

3. Off-Specification Used Oil Burner

Y ☐ N ☐

4. Used Oil Fuel Marketer

- If "Yes", mark all that apply.
- ☐ a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner
- ☐ b. Marketer Who First Claims the Used Oil Meets the Specifications

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D. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR Part 262 Subpart K

- ❖ You must check with your State to determine if you are eligible to manage laboratory hazardous wastes pursuant to 40 CFR Part 262 Subpart K

☐ 1. Opting into or currently operating under 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories
See the item-by-item instructions for definitions of types of eligible academic entities. Mark all that apply:

- ☐ a. College or University
☐ b. Teaching Hospital that is owned by or has a formal written affiliation agreement with a college or university
☐ c. Non-profit Institute that is owned by or has a formal written affiliation agreement with a college or university

☐ 2. Withdrawing from 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories

11. Description of Hazardous Waste

A. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g., D001, D003, F007, U112). Use an additional page if more spaces are needed.

B. Waste Codes for State-Regulated (i.e., non-Federal) Hazardous Wastes. Please list the waste codes of the State-Regulated hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.

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12. Notification of Hazardous Secondary Material (HSM) Activity

Y ☐ N ☐ Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 261.2(a)(2)(iii), 40 CFR 261.4(a)(23), (24), or (25)?

If "Yes", you must fill out the Addendum to the Site Identification Form: Notification for Managing Hazardous Secondary Material.

13. Comments

14. Certification. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. For the RCRA Hazardous Waste Part A Permit Application, all owner(s) and operator(s) must sign (see 40 CFR 270.10(b) and 270.11).

Signature of legal owner, operator, or an authorized representative	Name and Official Title (type or print)	Date Signed (mm/dd/yyyy)
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

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ADDENDUM TO THE SITE IDENTIFICATION FORM: NOTIFICATION OF HAZARDOUS SECONDARY MATERIAL ACTIVITY



Before filling out this section:

- ❖ You must check with your State to determine if you are eligible to manage hazardous secondary material under 40 CFR 261.2(a)(2)(ii), 261.4(a)(23), (24), or (25). (See also <http://www.epa.gov/epawaste/hazard/dsw/statespf.htm>.)
- ❖ You must be managing hazardous secondary material, which is secondary material (e.g., spent material, by-product, or sludge) that when discarded, would be identified as hazardous waste under 40 CFR Part 261. Do not include any information regarding your hazardous wastes in this section.
- ❖ You must submit a completed Site Identification Form, including this Addendum, prior to operating under the exclusion(s) and by March 1 of each even-numbered year thereafter to your regulatory authority using the Site Identification Form as pursuant to 40 CFR 260.42. Persons who must satisfy this notification requirement can submit information at the same time as their Biennial Report (which is also due by March 1 of each even-numbered year).
- ❖ If you stop managing hazardous secondary material in accordance with the exclusions(s) and do not expect to manage any amount of hazardous secondary material under the exclusions(s) for at least one year, you must also submit a completed Site Identification Form, including this Addendum, within thirty (30) days pursuant to 40 CFR 260.42.

1. Indicate reason for notification. Include dates where requested.

- ☐ Notifying that the facility will begin managing hazardous secondary material as of _____ (mm/dd/yyyy).
- ☐ Re-notifying that the facility is still managing hazardous secondary material.
- ☐ Notifying that the facility has stopped managing hazardous secondary material as of _____ (mm/dd/yyyy).

2. Description of hazardous secondary material (HSM) activity. Please list the appropriate codes and quantities in **short tons** to describe your hazardous secondary material activity ONLY (do not include any information regarding your hazardous wastes in this section). Use additional pages if more space is needed.

a. Facility code (answer using codes listed in the Code List section of the instructions)	b. Waste code(s) for hazardous secondary material (HSM)	c. Estimated short tons of HSM to be managed annually	d. Actual short tons of HSM that was managed during the most recent odd-numbered year	e. Land-based unit code (answer using codes listed in the Code List section of the instructions)

3. Facility has financial assurance pursuant to 40 CFR 261 Subpart H. (Financial assurance is required for reclaimers and intermediate facilities managing hazardous secondary material under 40 CFR 261.4(a)(24) and (25))

Y ☐ N ☐ Does this facility have financial assurance pursuant to 40 CFR 261 Subpart H?